



**mineral resources**

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

## **BASIC ASSESSMENT REPORT**

**AND**

## **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

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## REVISION AND APPROVAL

<b>REVISION NUMBER:</b>		01	
<b>ENVIRONMENTAL MANAGEMENT ASSISTANCE (PTY) LTD (EMA) REF:</b>		Nomamix (Pty) Ltd Non-Invasive Prospecting on Farm Mareesburg 8 JT, Limpopo	
<b>TITLE:</b>		ENVIRONMENTAL BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR THE LISTED ACTIVITIES IN TERMS OF NEMA ACTIVITIES ASSOCIATED WITH THE NON-INVASIVE PROSPECTING OF FARMS MOORDKOPJE AND ZWARTFONTEIN	
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### DISTRIBUTION:

To	DESCRIPTION	DATE	COMMENTS/CHANGES
Daneal Nieuwoudt CC. Walter Murray	Review and Approval	8 September 2022	Removal of reference to prospecting of Chrome.

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## EXECUTIVE SUMMARY

Nomamix (Pty) Ltd (the applicant) is applying for the right to prospect Platinum Group Metals, on the Farm Mareesburg 8 JT, in the magisterial district of Fetagomo Tubatse, Limpopo.

The proposed non-invasive prospecting activities will include the following main techniques:

- Data search, field mapping, and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

As such, Environmental Management Assistance (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) in terms of Regulation 12 of the Environmental Impact Assessment Regulations (GNR 982 GG 38282 of 4 December 2014, as amended), published in terms of Sections 24 (5) and 44 of the National Environmental Management Act (NEMA Act No. 107 of 1998), hereafter referred to as the NEMA 2014 EIA Regulations, to manage the required Basic Assessment Process. To commence with the BA process, it is important to first understand the key listed activities in terms of NEMA (**Table 1**), associated with non-invasive prospecting.

### LEGISLATIVE CONTEXT

The following listed activities are relevant to this application:

Table 1: Listed activities being triggered by the proposed coal mine

ACTIVITY DESCRIPTION	RELEVANT LEGISLATION	LISTED ACTIVITIES	KEY PROCESS COMPONENTS
<b>NON-INVASIVE PROSPECTING</b>	<b>GNR. 983 GG 38282 dated 8 December 2014</b> (as amended– Environmental Impact Assessment Regulations, Listing Notice 1	<b>Listed activity 20:</b> 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 this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.	<ul style="list-style-type: none"> <li>• Environmental Authorisation (EA) application in terms of NEMA;</li> <li>• Site Sensitivity Verification Report;</li> <li>• Basic Assessment Report (BAR), Environmental Management Programme (EMPr), and Closure Plan;</li> <li>• Specialist Reporting as required by the Screening Report generated by the National Web-based screening tool; and</li> <li>• Engagement with the registered I&amp;AP.</li> </ul>

Based on the defined listed activities, the EAP has determined that a desktop and site sensitivity verification assessment informing the BA process applies to the required application for Environmental Authorisation (EA).



This Basic Assessment Report (BAR) and Environmental Management Programme (EMPr) would sufficiently achieve the objective as contemplated in Appendix 1 and 4 of the NEMA 2014 EIA regulations and provide the competent authority (CA), Limpopo's Department of Mineral Resources and Energy (DMRE), with the required information to make an informed decision to issue an Environmental Authorisation (EA).

The first step to determining the environmental impacts of the proposed non-invasive prospecting is to perform a site verification and screening identifying potential environmental and social sensitivities to consider during the BA process.

### ***SITE SENSITIVITY VERIFICATION AS PER THE SCREENING REPORT***

As a result of the Screening Report generated by the National Screening Tool, as required by the NEMA 2014 EIA regulations, various environmental sensitivities have been identified. Based on the environmental sensitivities, the following list of specialist baseline assessments has been identified for inclusion in this BA process:

- Agricultural Verification Assessment (including soils);
- Desktop Archaeological, Cultural, and Palaeontology Verification Assessment;
- Terrestrial Biodiversity (Fauna and Flora included) Verification Assessment;
- Aquatic Biodiversity Verification Assessment;
- Desktop Hydrology Flood-line determination; and
- Desktop Noise Assessment.

Various protocols (GN 320 (GG 43110 dated 20 March 2020) require that before commencing with the said specialist assessment, the current use of land and the environmental sensitivity of the site must be confirmed by undertaking a site sensitivity verification) have been published for the specialist assessments. Where no specific assessment protocol has been prescribed a site sensitivity was performed using accepted verification techniques and by following the general protocols in line with Appendix 6 of the NEMA 2014 EIA Regulations.

On-site verification and the outcome of the desktop verification of the site sensitivities are attached to this report as **Appendix D – Site Sensitivity Verification**.

As a result of the desktop assessment and verified site sensitivities, areas to avoid, or no-go sites have been defined within the prospecting right area.

### ***NEED AND DESIRABILITY***

Various factors were taken into consideration to assess the "Need and Desirability" of the proposed non-invasive prospecting. These include, but are not limited to resource demand, economic desirability and demand and environmental sustainability and competing land uses.

The following statement(s) can be made with regards to the "Need and Desirability" of the proposed non-invasive prospecting right application:



- The end result of a prospecting right is to determine the financial feasibility to continue with mining of the available resources. Intensive historical prospecting data is available which supports the non-invasive prospecting method proposed.
- From a socio-economic perspective, the recorded status of unemployment, available job opportunities, and education, to list a few, highlights the need to further develop the mining sector within the Fetagomo Tubatste Local Municipality. The prospect of developing a future mine, following the positive feasibility outcome of the proposed non-invasive prospecting associated with this application therefore is supported by the municipal's Integrated Development Plan.
- The proposed non-invasive nature of the prospecting right application results in no impacts. However, following the desktop assessment and site sensitivity verification outcome (**Appendix D – Site Sensitivity Verification**), areas to avoid, or no-go sites have been defined within the prospecting right area. The identified sensitivities are defined and mapped and attached as **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

#### **ASSESSMENT OF ALTERNATIVES**

Due to the non-invasive nature of the proposed prospecting activities, i.e. desktop prospecting with no planned drilling, excavations or trenching, no alternatives were assessed as part of the BA process.

However, following the desktop assessment and site sensitivity verification outcome (**Appendix D – Site Sensitivity Verification**), areas to avoid, or no-go sites have been defined within the prospecting right area.

The identified sensitivities are defined and mapped and attached as **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

#### **IMPACT STATEMENT**

A desktop-based, followed by a site sensitivity verification (**Appendix D – Site Sensitivity Verification**), impact assessment has been undertaken, which has incorporated consultation with an appointed independent specialist, and resulted in this report.

No alternatives were considered (see **Sections g),h), and i)**) due to the non-invasive nature of the proposed prospecting right application. However, verified sensitive areas were defined (**Appendix C – Site Layout Plan, Sensitivities, and Land Use**) and should be considered as potential “no-go” or “area requiring further investigation” should there be a planned change in scope. A change in scope (i.e. from non-invasive to intrusive prospecting) will require that the relevant amendment process as per the NEMA 2014 EIA Regulations (as amended), be initiated to review the issued EA.

It is the EAP's opinion that due process has been followed in terms of identifying potential impacts and or risks found to be potentially significant, and that should be further assessed if a change in scope is required.

It is recommended that the proposed **non-invasive prospecting** is allowed to proceed on the assumption that the environmental and social management commitments are adhered to, the scope of the prospecting remains as per the description provided in this document and considering the positive social impacts associated with the proposed prospecting right.



No intrusive prospecting activities shall continue without following the required EA amendment process as stipulated in the NEMA 2014 EIA regulations.

### **REASONED OPINION FOR AUTHORISATION**

The appointed EAP and associated Specialist recommends that on the conditions that all the requirements, conditions, and measures listed in this document and associated appendices be adhered to, that there is no reason why this activity should not be authorised.

Due to the **non-invasive** nature of the proposed prospecting right application, the EAP and all specialists have confirmed that there is **no impact or risk**.

However, should the scope change of the non-invasive prospecting be considered, it is concluded that **further assessment** of all aspects, deemed applicable by the independent EAP, **is required**.

Based on the outcome of this assessment and information informing the opinion of the independent EAP, it is recommended that the following conditions be specified and considered as conditions of the EA:

- The issued EA only relates to the proposed non-invasive prospecting activities. Should the holder of the authorisation (HoA), or the persons appointed to conduct the prospecting on behalf of the HoA, identify or plan the need for a change in scope, an application for amending the scope of the EA in terms of the NEMA 2014 EIA Regulations (as amended) must be submitted.
- The identified sensitivities as provided in **Appendix C – Site Layout Plan, Sensitivities, and Land Use**, must be considered as potential “No-go” or “areas requiring further assessment”, pending a detailed impact assessment and management or mitigation implementation plan.
- The management and mitigation actions provided in Part B – Environmental Management Programme Report must be implemented before and during the required process to amend the issued EA in terms of the NEMA 2014 EIA Regulations.
- An independent suitably qualified Environmental Inspector, preferably a registered EAP, must be appointed by the HoA to inspect, confirm, and report any non-conformances with the EA and requirements of the EMPr every quarter. Records of these inspections must be kept and readily available to the relevant Environmental Management Inspectorate (EMI).
- Auditing of compliance with the EA and EMPr in terms of Part 3, Regulations 34 of the NEMA 2014 EIA Regulations (as amended) must be conducted on an annual basis. This audit is to be conducted preferably by an independent registered EAP.

### **ENVIRONMENTAL MANAGEMENT PROGRAMME**

No specific impact management objectives and outcomes can be defined for the proposed non-invasive prospecting right application, as it has been highlighted throughout this report that there is no impact or risk defined.

However, from the desktop and site sensitivity verification (**Appendix D – Site Sensitivity Verification**) there is a potential of several predetermined potential impacts and risks (**Section iv**) identified should the applicant change the scope of this application.



**Part B – Environmental Management Programme Report** provides mitigation and management measures that must be implemented before and during the required process to amend the issued EA in terms of the NEMA 2014 EIA Regulations.

#### ***PERIOD FOR WHICH EA IS REQUIRED***

The proposed non-invasive prospecting is planned over a total of five (5) years. In terms of Section 18 (4) of the Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002), following the acceptance of the renewal application, the prospecting right may be renewed once for a period not exceeding three years.

#### ***PUBLIC PARTICIPATION***

This document is the “draft” BAR and EMPr, providing the registered Interested and Affected Parties (I&AP) an opportunity to comment as per the required commenting period of at least 30 days.

It is, therefore, requested that all comments on the BAR & EMPr and associated appendices be submitted in form of a formal correspondence (email, SMS, fax, and/or during an arranged public meeting) using the following contact information:

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## 1. IMPORTANT NOTICE

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

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

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

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

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





## 2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- (a) Determined 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 locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determined:
  - (i) The nature, significance, consequence, extend, 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.



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## PART A – SCOPE OF BASIC ASSESSMENT REPORT

### 1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

#### A) DETAILS OF

##### i) DETAILS OF THE EAP

<b>Name of the Practitioner:</b>	Environmental Management Assistance (Pty) Ltd
<b>Contact person:</b>	Anandi Alers
<b>Tel No.:</b>	+27 (0) 72 604 0455
<b>Fax No.:</b>	+27 (0) 86 226 7324
<b>E-mail address:</b>	anandi.alers@emassistance.co.za

##### ii) EXPERTISE OF THE EAP

EMA has appointed Mrs. Anandi Alers (EAPASA reg. no. 2019/1514) as the EAP to manage the application process on behalf of Nomamix (Pty) Ltd.

A detailed portfolio of the team members associated with the management of this project can be found in **Appendix A – EAP Qualifications and Team Members**.

#### (1) THE QUALIFICATIONS OF THE EAP

*(with evidence)*

Mrs. Anandi Alers completed a Master of Science degree in Environmental Management and Geography in 2015 at the North West University (Potchefstroom) under the guidance of Prof. Luke Sandham.

She holds a Bachelors of Science Honours degree in environmental sciences, specialising in Environmental Management and Geography, and a Bachelors of Science degree in Tourism, Zoology, and Geography.

#### (2) SUMMARY OF THE EAP'S PAST EXPERIENCE

*(In carrying out the Environmental Impact Assessment Procedure)*

Mrs Anandi Alers has extensive knowledge of the South African EIA process and holds a Master of Science degree in Environmental Management on the subject of EIA follow-up. Her practical experience includes, but is not limited to the following:

- Environmental Management of several construction, mining, and industry-related projects;
- Environmental auditing of a number of projects against the approved EMPr's and EA (Environmental Authorisations);
- The development and management of an ISO 14001 EMS (Environmental Management Systems) on a number of construction, mining and industry related projects;





- Development and implementation of policies and procedures managing environmental impacts; and
- Managing applications for a number of permits and licences.

A detailed description of all past experiences is available in **Appendix A – EAP Qualifications and Team Members**.

## B) LOCALITY OF THE OVERALL ACTIVITY

<b>Farm Name:</b>	Portion 0, 1, 2, 6, and 7 of Farm Mareesburg 8 JT
<b>Application area (Ha) :</b>	2133.29 ha
<b>Magisterial district:</b>	Fetagomo Tubatse, Limpopo
<b>Distance and direction from nearest town:</b>	Lydenburg is the nearest town, 45km east from the area, Mpumalanga Province
<b>21 digit Surveyor General Code for each farm portion:</b>	T0JT0000000000800000 T0JT0000000000800001 T0JT0000000000800002 T0JT0000000000800006 T0JT0000000000800007

## C) LOCALITY MAP

(show nearest town, scale not smaller than 1:250000)

See **Appendix B – Locality Map** indicating the locality of the proposed activity.

## D) DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

(Provide a plan drawn to scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site.)

The site layout indicating the location and the boundaries of the extend of the prospecting right area can be found in **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

### i) LISTED AND SPECIFIED ACTIVITIES

<b>NAME OF ACTIVITY</b> (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	<b>Aerial extent of the Activity</b> Ha or m <sup>2</sup>	<b>LISTED ACTIVITY</b> Mark with an X where applicable or affected.	<b>APPLICABLE LISTING NOTICE</b> (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Non-invasive prospecting (desktop prospecting)	2133.29 ha	X	GNR. 983 GG 38282 dated 4 December 2014 (as amended) - <b>Listed activity 20</b>

### ii) DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

(Describe Methodology or technology to be employed, including the type of commodity to be prospecting and for a linear activity, a description of the route of the activity)



Nomamix (Pty) Ltd (the applicant) is applying for the right to prospect Platinum Group Metals and Chrome Ore, on the Farm Mareesburg 8 JT, in the magisterial district of Fetagomo Tubatse, Limpopo.

The proposed non-invasive prospecting activities will include the following main techniques:

- Data search, field mapping and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

Table 2 provides a summary of the resources applicable to the non-invasive prospecting right.

Table 2: Resource particulars associated with the proposed non-invasive prospecting right

ITEM	DETAIL
Type of Mineral (s)	PGM's within MG Chromitite Layers (MG0, MG1, MG2, MG3, MG4 and MG4A), including: Platinum (Pt), Palladium (Pd), Rhodium (Ru), Ruthenium (Re), Osmium (Os), Iridium (Ir) and base metals Copper (Cu), Nickel (Ni) and Gold (Au).
Geological Formation	Bushveld Complex, Rustenburg Layered Suite, Lower Critical Zone

For the purposes of this Basic Assessment (BA) process, the Environmental Assessment Practitioner (EAP) and appointed specialist will perform a baseline and/or desktop assessment identifying potential sensitivities in the general area of the properties.

Should additional sampling be required using any invasive prospecting methods, the areas where these activities will take place will require the necessary assessments as per the various protocols published for identified themes and approval from the Department of Minerals, Resources and Energy (DMRE), prior to commencement of any such activities.



## E) POLICY AND LEGISLATIVE CONTEXT

<b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b> (A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	<b>REFERENCE WHERE APPLIED</b> (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	<b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT</b> (E.g In terms of the National Water Act-Water Use Licence has/has not been applied for).
<b>National Legislation and regulations</b>		
<b>Section 24 of the Constitution of South Africa Act No. 108 of 1996</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	Adherence with all legislation and regulations that prevents pollution and ecological degradation, promotes conservation, and secures an ecological sustainable development and use of natural resources while promoting justifiable economy and social development.
<b>The Mineral and Petroleum Resources Development Act, 2002 Act No. 28 of 2002 (MPRDA)</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	<ul style="list-style-type: none"> <li>• Submission of a prospecting works programme.</li> <li>• Submission of an application to a prospecting right.</li> <li>• Application for Environmental Authorisation in process (purpose of this report).</li> <li>• A Liability Estimation and Final Rehabilitation, Decommissioning and Prospecting Closure Plan (LRDCP) are <b>not applicable</b> due to the non-invasive prospecting activities to be undertaken.</li> </ul>
<b>National Environmental Management Act No. 107 of 1998 (NEMA)</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	<ul style="list-style-type: none"> <li>• Development of an EMPr for the proposed activities.</li> <li>• Application for authorisation resulting in the submission of this document.</li> <li>• Ensuring compliance with a monitoring and audit schedule and plan.</li> </ul>
The following regulations in terms of NEMA are applicable:		
<b>GN R. 982 (GG 38282 dated 4 December 2014, as amended): National Environmental Management Act (107 of 1998): Environmental Impact Assessment Regulations, 2014</b>  (2014 NEMA EIA regulations)	Part A: BAR process followed Part B: Requirements included in the EMPr	Independent EAP appointed to ensure adherence with the BAR procedure.



<p><b>GN R. 983 – 985 (GG 38282 dated 4 December 2014, as amended):</b> Listing notices 1 to 3</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Application for authorisation of listed activities submitted followed by the submission of the BAR and EMPr.</p>
<p><b>GN. 320 (GG 43110 dated 20 March 2020):</b> Procedure 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 when applying for environmental authorisation.</p> <p><b>GN. 1150 (GG 43855 dated 30 October 2020):</b> Procedure 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 when applying for environmental authorisation. (Terrestrial animal and plant specie themes)</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>A Site Sensitivity Verification Report (<b>Appendix D – Site Sensitivity Verification</b>) completed by the EAP.</p>
<p><b>GN R. 1147 (GG 39425 dated 20 November 2015, as amended):</b> Regulations pertaining to the financial provision for prospecting, exploration, mining or production</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Due to the non-invasive prospecting nature of the proposed prospecting right application, <u>no</u> Financial Provisioning Estimation can be determined. However, should the applicant wish to change the scope, a detailed required estimation calculation will be required in line with this regulations.</p>
<p><b>National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA)</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Non-invasive prospecting.</p> <p>However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.</p>
<p>The following regulations in terms of NEMAQA are applicable:</p>		
<p><b>GN 893 (GG 37054 dated 22 November 2013, as amended):</b> List of activities which result in atmospheric emissions</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Non-invasive prospecting.</p>
<p><b>GN R. 827 GN R. 827 (GG 36974 dated 1 November 2013):</b> National dust control regulations</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.</p>
<p><b>GN R. 283 (GG 38633 dated 2 April 2015):</b> National atmospheric emissions reporting regulations</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>GN R. 1210 (GG 32816 dated 24 December 2009):</b> National ambient air quality standards</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	



<p><b>GN 893 (GG 37054 dated 22 November 2013, as amended):</b> List of activities which result in atmospheric emissions</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>Atmospheric Pollution Prevention Act of 1965</b></p> <p><b>GN R. 1651 (GG 4393 dated 20 September 1974):</b> Regulations concerning the control of noxious or offensive gasses emitted by diesel-driven vehicles</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>National Environmental Management: Waste Act 59 of 2008 (NEMWA)</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p>The following regulations in terms of NEMWA are applicable:</p>		
<p><b>GN R. 634:</b> Waste classification and management regulations</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>GN R. 634 (GG 36784 dated 23 August 2013):</b> Waste classification and management regulations</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>GN R. 632 (GG 39020 dated 24 July 2015, as amended):</b> Regulations regarding the planning and management of residue stockpiles and residue deposits from prospecting, mining, exploration or production operation</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>GN R. 921 (GG 37083 dated 29 November 2013, as amended):</b> Activities listed requiring a waste management licence (WML)</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Non-invasive prospecting.</p>
<p><b>GN R. 633 (GG 39020 dated 24 July 2015):</b> Amendments to the list of waste management activities that have, or are likely to have, a detrimental effect on the environment</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.</p>
<p><b>GN R. 625 (GG 35583 dated 13 August 2012):</b> National waste information regulations</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>Environmental Conservation Act of 1989 (ECA)</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	



<p><b>GN R. 425 (GG 31901 dated 13 February 2009):</b> Waste tyre regulations</p> <p><b>GN R. 341 (GG 30904 dated 28 March 2008):</b> Regulations for the prohibition of the use, manufacturing, import and export of asbestos and asbestos containing materials</p> <p><b>GN R. 154 (GG 13717 dated 10 January 1992):</b> Noise control regulations in terms of section 25 of ECA</p>		
<p><b>National Water Act 36 of 1998 (NWA)</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p>The following regulations in terms of NWA are applicable:</p>		
<p><b>GNR 267 (GG 40713 dated 24 March 2017):</b> Water Use Licence Application and Appeals Regulation, 2017</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Non-invasive prospecting.</p> <p>However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.</p>
<p><b>GN 704 (GG 20119 dated 4 June 1999):</b> Regulations on use of water for mining and related activities aimed at the protection of water resources</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>No Water Use Licence Application applicable to the proposed non-invasive prospecting.</p>
<p><b>Hazardous Substances Act 15 of 1973</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	
<p><b>Petroleum Products Act of 1977</b></p> <p><b>GN R. 627 (GG 44363 dated 30 March 2021):</b> Regulations regarding petroleum products specification and standards</p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	<p>Non-invasive prospecting.</p> <p>However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.</p>
<p><b>Prospecting Health and Safety Act of 1996</b></p>	<p>Part A: BAR process followed Part B: Requirements included in the EMPr</p>	



<b>GN R. 1237 (GG 25404 dated 29 August 2003):</b> Prospectings and works regulations		
<b>GN R. 911 (GG 29217 dated 8 September 2006):</b> Prospecting health and safety regulations		
<b>National Road Traffic Act of 1996</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>GN R. 225 (as amended by GN. 485 GG 35413 dated 8 June 2012):</b> National Road traffic regulations		
<b>Human Tissue Act No. 65 of 1983</b>		
<b>National Health Act, 2003 – Regulations regarding the general control of human bodies, tissue, blood, blood products and gametes</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>Medicines and related substances control Act 101 of 1965 &amp; regulations</b>		
<b>Fertilizers, farm feeds, agricultural remedies and stock remedies Act 36 of 1947</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>Conservation of Agricultural Resources Act 43 of 1983 (CARA)</b>		
<b>GN R. 1048 (GG 9238 dated 25 May 1984, as amended):</b> Declared Weeds and Invader plants	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>National Veldt and Forest Fire Act 101 of 1998</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>National Forest Act 84 of 1998</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>National Heritage Resources Act 25 of 2000</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>Carbon Tax Act No. 15 of 2019</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	
<b>Government Policies</b>		
<b>Waste Management policies</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	Non-invasive prospecting.



<b>National Environmental Health Policy</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.
<b>SANS Standards</b>		
<b>Hazardous substances management</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	Non-invasive prospecting.  However, requirements stipulated in the EMPr ensuring requirements of the act/regulations are taken into consideration as part of the NEMA 2014 EIA Regulations amendment process.
<b>Provincial Legislation</b>		
<b>Limpopo Environmental Management Act, Act No. 7 of 2003</b>	Part A: BAR process followed Part B: Requirements included in the EMPr	A Site Sensitivity Verification Report ( <b>Appendix D – Site Sensitivity Verification</b> ) completed by the EAP.





## F) NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

*(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).*

A desktop assessment, based on available information, of the need and desirability of the proposed non-invasive prospecting right application was assessed taking the following into consideration:

- Resource desirability and demand;
- Economic desirability and demand; and
- Environmental sustainability and competing land-uses.

### F.1 RESOURCE DESIRABILITY AND DEMAND

The eastern margin of the area is underlain by gently westly dipping Pretoria Group sediments (floor sediments) Shallow westerly dipping Bushveld Critical, Lower and Marginal unconformably overly the Pretoria Group sediments in the area, with a N-S trending floor-contact. Bushveld Zones dip range from 5°W to 15°W, although locally steeper dips may occur. Critical, Lower and Marginal units sub-outcrop over the area. These units are known to host Chromitite Layers across the Bushveld Igneous Complex.

The aim of this application is to determine the resource potential of the Chromitite Layers within these Zones. Existing mining operations are taking place towards the west and north of the application area.

### F.2 ECONOMIC DESIRABILITY AND DEMAND

In 2016, the Fetakgomo Tubatse Local Municipality (FTLM) was formed as an amalgamation between the former Fetakgomo Local Municipality and the former Greater Tubatse Municipality. The area falls under the jurisdiction of the Sekhukhune District Municipality, Limpopo.

According to the recent official demographic survey results (2016), the FTLM has a total population of 490 381 people (Statistics South Africa Community Survey, 2016).

The municipality comprises approximately 342 villages and is largely dominated by a rural landscape with only 6 (six) proclaimed townships. Like most rural municipalities in South Africa, the FTLM is characterised by a weak economic base, inadequate infrastructure, major service backlogs, dispersed human settlements and high poverty levels (FTLM: Integrated Development Plan (IDP): 2021).

The proposed non-invasive prospecting right area are situated within Ward 27 of FTLM and according to the 2011 Population Census has a population of 12 527 people and a 22.1% employment rate. About 43 % of the population are not economically active and 32 % is unemployed. In terms of education, only 20.4 % of the population completed matric or higher and 55.3 % completed Grade 9 or higher (Statistics South Africa (StatsSA), 2011).



Table 3: Employment profile

EMPLOYMENT AND INCOME LEVELS					
AREA	EMPLOYED	UNEMPLOYED	DISCOURAGED WORK-SEEKER	OTHER NON-ECONOMICALLY ACTIVE	ANNUAL HOUSEHOLD INCOME BELOW R40K
Limpopo	27.4%	17%	6%	49%	70%
Sekhukhune District	20.9%	22%	7%	50%	70%
FTLM	23%	25%	5%	47%	71%
Ward 27	22.1%	32%	3%	43%	65%

Source: StatsSA: Community Survey 2016 and Census 2011 for ward based information

Basic service delivery within the municipality proves to be a challenge based on the statistics:

- **Water** - Within Ward 27, 62% of the residents still received their water for household use from the river. Only 19,5% received their water from a regional service provider (StatsSA, 2011). It should be noted that progress has been made in terms of water provision in FTLM, but that 35,4% of households in FTLM still did not have access to safe drinking water supply service in 2016. The IDP further indicated that there are still severe challenges and water shortages within Ward 27 (FTLM: IDP: 2021).
- **Sanitation** - A total of 78% of the households still make use of pit latrines, with only 4% of these being Ventilated Improved Pit (VIP) latrines. Those without access to any sanitation type facility totals 11% which are almost double the rate compared to the Sekhukhune District.
- **Electricity** - ESKOM is the electricity service provider to the FTLM. According to the Community Survey of 2016, 82% of households in the FTLM had access to in-house prepaid meters with 10% that had no access to any type of formal electricity provision. These households still rely on candles and paraffin (FTLM: IDP 2021). A large section of the rural population has no, to very limited access, to electricity which impacts negatively on local economic development and community projects (FTLM: IDP: 2021).
- **Waste Collection** - In FTLM only 10% of the population received a service from the municipality or private company. The majority of households rely on their own dumps. The widespread inadequacy of formal refuse removal services in the municipal area poses a health hazard to the rural communities and is particularly problematic to businesses (FTLM: IDP: 2020).

The FTLM economy is driven by mining and agriculture. Mining still presents the largest opportunity in the area and the mining activities and natural resources available in the area have created a definite potential to develop tourism and thereby to diversify the economic base of the municipality (FTLM: IDP: 2020).

The mining industry is furthermore the municipality's leading job creator and key economic growth driver. With all major mining houses fully represented in the municipality, locals pin their hopes for jobs and income security in this sector. The mining sector accounts for 34% of the Municipality's total GVA and 54% of the total labour force in the formal sector. The job absorption patterns during a 12-year review period in the sector shows that year 2012 witnessed the highest number of jobs (1833) created.



It is feared that the Covid-19 lockdown, which has already devastated rural communities, could have an even more dire effect on mine-affected communities. The Quarterly Labour Force Survey by Statistics SA revealed that Limpopo lost 236 000 jobs due to the Covid-19 pandemic and that all sectors of the economy suffered job losses with the exception of the agriculture sector, in which 16 000 jobs were created ([www.mg.co.za](http://www.mg.co.za)).

The Limpopo Provincial Government identified the Fetakgomo-Tubatse area in Steelpoort for a Special Economic Zone (SEZ) development, which is proposed to be established at Dithamaga Trust in Ward 27 (situated about 21 km north of the proposed non-invasive prospecting right area). The initiative started as a joint venture between mining operators in the area. The establishment of the SEZ is driven by the projected mining and beneficiation forecasts of the Platinum Group of Metals (PGM). Such a zone can change the socio-economic characteristics in the region by accelerating the manufacturing base, promoting industrialisation and attracting investments. According to the Limpopo Economic Development Agency (LEDA), the Tubatse Special Economic Zone will impact positively on more than a million people in the province due to improved economic activities within the Dilokong Spatial Economic Initiative as well as improving economic progress within other districts and municipalities (FTLM: IDP: 2021).

The agriculture sector in the FTLM is still emerging and heavily under-invested. Lack of mechanisation makes smallholder farming one of the smallest contributors to the municipality's economic growth.

The manufacturing sector covers the manufacturing of goods, products and beverages. It also comprises the production, processing and preservation of meat, fish, fruit, vegetables, oils and dairy products; grain mill, starches and tobacco products; textile products; spinning, weaving; and petroleum products and nuclear fuel. This sector has a vast potential as job creator but is still in its infancy.

With regards to the tourism sector, it was noted that the unique selling benefits of local heritage sites and other tourism facilities in the municipality are not effectively profiled and marketed. The tourism sector is further being overshadowed by mining to the extent that more strategic focus is unevenly invested in the latter at its expense.

Investment opportunities in the FTLM include:

- Mining investment;
- Land availability;
- Tourism;
- Funding source from private sector; and
- Job creation from infrastructure investment.



### F.3 ENVIRONMENTAL SUSTAINABILITY AND COMPETING LAND-USES

The proposed non-invasive prospecting activities is situated within Zone B (Highveld to Bushveld transition area) of the Olifants Environmental Management Framework (OEMF).

#### **Constraints, opportunities, and potential conflicts within the OEMF**

As per the OEMF, several constraints have been identified for this zone, including the following:

- Over-allocation of water resources;
- Drought has been identified as a possible risk;
- A high possibility of containing critically endangered and endangered vegetation, which currently does not fall within a statutory or private protected area;
- Risk of losing vegetation from encroaching developments;
- Excessive medicinal plant harvesting;
- Pollution of water resources from human activities; and
- Poorly functioning municipal sewage treatment plants.

The following opportunities have been identified by the published OEMF:

- Rich in mining resources (chrome, platinum and vanadium) and potential for future mining operation exists;
- Part of the Sekhukhune Centre of Endemism (SCE) and has a relatively unspoilt natural environment where large areas has been identified as possible conservation areas by the National Protected Areas Expansion Strategy (containing endangered vegetation);
- Good opportunity for conservation, recreation and tourism;
- Development of cultural activities also has some potential; and
- Some areas classified as highly arable land and irrigated agriculture also takes place in this zone.

There are, however, potential conflicts between the opportunities identified above, as in most instances the mining resources overlaps with the SCE, implying that an opportunity cost analysis will be required to determining how the course of action of one opportunity, will affect the viability of the other. In this zone the main conflict anticipated is tourism and conservation verses mining activities.



### Desired state of the OEMP

Table 4 summarises the desired state of management Zone B and identified management guidelines:

Table 4: Summary of the desired state of management Zone B and identified management guidelines

TOPIC	REQUIRED STATE	GUIDELINES	RESPONSIBILITY
Water utilisation	<ul style="list-style-type: none"> <li>Due to the over-allocation of water resources within this zone, the ecological reserve requirements must always be met ensuring the health of the river ecosystem.</li> <li>Due to current activities within this zone causing significant pollution, the strictest possible water quality release standards must be applied.</li> <li>Releases must be monitored effectively, and transgressors should be dealt with in terms of the applicable legislation.</li> <li>Introduction of a polluter pays charge system should be considered that allocates clean-up cost as well as the opportunity cost of the pollution to the polluter.</li> </ul>	<p><u>Water allocation:</u></p> <ul style="list-style-type: none"> <li>No further negative impact on the ecological reserve of any part of the river system.</li> <li>Water allocation to meet the needs of municipalities to take prevalence over the allocation to other users.</li> <li>Water allocations for the agricultural, mining and industrial sectors must come from savings from existing allocations that are relocated.</li> <li>Illegal use of water must be investigated, followed up and perpetrators should be prosecuted.</li> </ul> <p><u>Water quality:</u></p> <ul style="list-style-type: none"> <li>Water released back into the system must comply with the relevant quality standards for the specific category of system.</li> <li>Water release quality standards must be applied strictly, and transgressors should be prosecuted.</li> <li>Municipalities should be capacitated to upgrade and manage sewage works to acceptable standards.</li> <li>Municipalities that fail, should be prosecuted.</li> </ul>	Department of Water and Sanitation (DWS) and water users
Conservation	<ul style="list-style-type: none"> <li>Due to the high conservation potential and several existing conservation areas, conservation should be the dominant and key land use in the area.</li> <li>Establishment of conservation zones should be actively encouraged.</li> <li>All other activities that are allowed in the area should be done in such a way that it does not diminish the conservation potential.</li> <li>Ecology of river systems should be rehabilitated to a natural state.</li> </ul>	<ul style="list-style-type: none"> <li>All natural wetlands, riparian areas and river systems that occur in the zone as depicted on Spot 5 satellite images dated on or before 30 November 2009 must be maintained in at least the area and condition as at 30 November 2009.</li> <li>Conservation and associated tourism are the preferred land-use in the area and any other land-use that is allowed should not have</li> </ul>	<ul style="list-style-type: none"> <li>Land owners and users</li> <li>DEA, Department of Mineral Resources and Energy (DMRE)</li> </ul>



	<ul style="list-style-type: none"> <li>Exotic fish species and other organisms in the zone should be eradicated to allow for the reestablishment of indigenous species in the rivers and streams.</li> </ul>	significant detrimental long term impact on the conservation land-use focus.	, LDEDET and MDEDET
Tourism	<ul style="list-style-type: none"> <li>Due to the high potential for natural tourism, the active promotion of tourism in this zone should become a planning priority at national, provincial, and local levels of government.</li> <li>Private investment in tourism with an emphasis on quality tourism products that match the tourism potential of the area should be encouraged.</li> </ul>		
Mining	<ul style="list-style-type: none"> <li>Before any further mining is allowed in this zone, a Strategic Mining Plan (SMP) should be developed between the relevant government departments to ensure mining occurs in a manner that is appropriate to the overall nature of the zone.</li> <li>Meets the requirements to ensure that the conservation and tourism potential of the area is not diminished.</li> <li>Mining to be limited to an agreed maximum surface area and that further mining should be dependant on the successful completion and rehabilitation of mining activities as stipulated in the SMP.</li> </ul>	<ul style="list-style-type: none"> <li>A strategic mining plan should be developed for this zone that limits the unrehabilitated surface area of mines to the minimum possible.</li> </ul>	<ul style="list-style-type: none"> <li>DMRE</li> </ul>
Industry	<ul style="list-style-type: none"> <li>Due to the conservation and tourism potential within this zone, heavy industry should not be allowed in this zone.</li> <li>Metallurgical industries associated with mines in the zone should be located on derelict land outside the zone.</li> </ul>	<ul style="list-style-type: none"> <li>The EMF principles should be used as guiding norms in the evaluation and decision-making processes of activities that requires an authorisation, licence or permit from government.</li> </ul>	<ul style="list-style-type: none"> <li>All government institutions</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>Agriculture is not regarded as growth activity in Zone B due to limited suitable land.</li> <li>Cattle grazing as a land use on natural vegetation should continue where conservation is not established in a manner that does not lead to overgrazing.</li> <li>The same applies to game farms.</li> </ul>		
Transportation	<ul style="list-style-type: none"> <li>The current status of major roads within this area are exceptionally poor, and the repair and maintenance of these roads should therefore be a high priority.</li> </ul>		
Business, service and government	<ul style="list-style-type: none"> <li>The zone is rural in nature and business activities are limited to small rural towns and local service centres.</li> </ul>	<u>Cooperative government:</u>	<ul style="list-style-type: none"> <li>All government institutions</li> </ul>



	<ul style="list-style-type: none"> <li>• Legislation is ahead of the ability of government to implement it, prevails in this zone.</li> </ul>	<ul style="list-style-type: none"> <li>• Government instructions at all levels should coordinate their activities in such a way that authorisations, licences and permits issued does not conflict with one another.</li> <li>• Government should focus on implementation of legislation and policies especially in respect to compliance monitoring and enforcement.</li> </ul> <p><u>Air Quality:</u></p> <ul style="list-style-type: none"> <li>• The Air Quality Management Plan (AQMP) (currently being compiled) that will apply to the zone should be implemented.</li> <li>• The implementation of the AQMP should be monitored and where it fails corrective action must be taken.</li> </ul>	
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#### F.4 NEED AND DESIRABILITY ASSESSMENT

In addition to the above, the need and desirability of the proposed development was further assessed by answering the questions, as far as possible at this stage of the process, listed in the Guideline on need and Desirability (DEA, 2017).

**Table 5** and **Table 6** provides the answers to the questionnaire as per the guideline relevant to the proposed non-invasive prospecting right.

Table 5: Questions indicating how the development considered ecological sustainability and the use of natural resources

QUESTION		ANSWER	CROSS-REFERENCE
1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	Highlighted throughout this document, the proposed non-invasive prospecting will have no impact on the ecological integrity of the prospecting area. However, as part of the desktop assessment and site sensitivity verification, a number of sensitivities have been defined ( <b>Appendix C – Site Layout Plan, Sensitivities, and Land Use</b> ).	
1.1	How were the following ecological integrity considerations taken into account:	The application area is within the remaining extent of the EN <b>Sekhukhune Mountainlands Ecosystem</b> . This ecosystem is listed in GN 1002 <sup>1</sup> under Criterion F: Priority areas for meeting explicit biodiversity targets as defined by a systematic biodiversity plan.  <b>Key biodiversity features include:</b> <ul style="list-style-type: none"> <li>- <u>Two mammal species</u>: Juliana's Golden Mole and Gunning's Golden Mole;</li> <li>- <u>Eight bird species</u> including Blue Crane, Blue Korhaan and Cape Vulture, Grey Crowned Crane, Rudd's Lark, Southern Ground Hornbill, Wattled Crane, Yellowbreasted Pipit;</li> <li>- <u>Nineteen plant species</u> for example <i>Aloe fouriei</i>, <i>Gladiolus rufomarginatus</i>, <i>Lydenburgia cassinioides</i>, <i>Resnova megaphylla</i> (= <i>Ledebouria megaphylla</i>), <i>Scilla natalensis</i> (= <i>Merwillia plumbea</i>), and VU Sensitive species; and</li> <li>- <u>Five vegetation types</u> including Sekhukhune Montane Grassland, Sekhukhune Mountain Bushveld, Steenkampsberg Montane Grassland, Lydenburg Thornveld and Ohrigstad Mountain Bushveld.</li> </ul> <p>The ecosystem forms part of the Sekhukhuneland Centre of Endemism; it includes important sub-catchments, pans and wetlands and is important for grassland processes.</p> <p><b>Note:</b> <i>The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.</i></p>	The following Section(s) of this report holds reference:  <ul style="list-style-type: none"> <li>• <b>f</b>);</li> <li>• <b>g), h), and i)</b>;</li> <li>• <b>(1)(a)II, III, IV, V, and VI</b>;</li> <li>• <b>iv)</b>;</li> <li>• <b>v)</b>;</li> <li>• <b>vi)</b>;</li> <li>• <b>vii)</b>;</li> <li>• <b>m)</b>;</li> <li>• <b>n)</b>;</li> <li>• <b>o)</b>; and</li> <li>• <b>q)</b>.</li> </ul>
1.1.1	Threatened Ecosystems,		
1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure	The application area occurs in three wetland vegetation types, namely the CR Central Bushveld Group 1 (most of the central and western sections), the LC Mesic Highveld Grassland Group 6 (far eastern extent), and the EN Mesic Highveld Grassland Group 7 (within the eastern extent).	

<sup>1</sup> Government Notice (GN) 1002 National Environmental Management: Biodiversity Act (10/2004): National list of ecosystems that are threatened and in need of protection. Gazette 34809, 9 December 2011.





		<p>The Mareesburg prospecting right area falls within an area defined as a CODE 1 FEPA catchment. FEPA catchments achieve biodiversity targets for river ecosystems and 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. Although the FEPA status applies to the actual river reach, the surrounding land and smaller stream network needs to be managed in a way that maintains the good condition of the river reach.</p> <p>No wetlands are indicated by the NFEPA database within the Mareesburg prospecting right area, nor within the investigation area. The Groot-Dwars River and the Mareesburg Spruit traverse the Mareesburg prospecting right area and investigation area. The Groot-Dwars River is considered natural (Class A/B). The Mareesburg Spruit is considered largely natural (Class B). Both rivers are designated FEPA Rivers and therefore, in terms of the NFEPA Implementation Manual (2011), mining (and/or prospecting) is not considered a compatible land use within 1km (1000 m) of a riverine buffer around a river FEPA.</p> <p>Most of the application area is, however, in the Sekhukhune Centre of Plant Endemism (SCPE), with the far eastern corner in the Lydenburg Centre of Plant Endemism (LCPE) (van Wyk et al., 2002).</p> <p>The NPAES (2018) indicates that the application area is in Priority Focus Areas. For Limpopo, the Priority Focus Areas include various biodiversity features to target potential protected area expansion.</p>	
1.1.3	Critical Biodiversity Areas (“CBAs”) and Ecological Support Areas (“ESAs”),	<p>The entire application area (apart from a very small section in the north-western corner) occurs in a <b>CBA 2</b>, which are areas considered “optimal” best design selected sites, areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets.</p> <p>The Draft National Biodiversity Offset Guideline (October 2021) defines biodiversity thresholds, impact significance and implications thereof for offsetting as mitigation measure. CBA 2 is categorically defined as a “Threshold of major concern” and if the impact significance, after implementation of all measures, remains high, biodiversity offsetting are likely to be required. This should be considered during the application process for future mining activities associated with the proposed prospecting right area.</p> <p><b>Land Management Recommendations:</b> Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes. <b>Incompatible Land-Use:</b> Urban land-uses including Residential (golf estates, rural residential, resorts), Business, mining &amp; Industrial, Infrastructure (roads, power lines, pipelines). More intensive agricultural production than currently undertaken on site. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to CBA 2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets.</p>	
1.1.4	Conservation targets,		
1.1.5	Ecological drivers of the ecosystem,	See <b>Sections (1) (a) IV and V.</b>	
1.1.6	Environmental Management Framework,	As indicated in Section F.3, the OEMF is applicable to the proposed non-invasive prospecting right area.	
1.1.7	Spatial Development Framework, and	See Section F.2.	



1.1.8	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	None.
1.2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	<p>Highlighted throughout this document, the proposed non-invasive prospecting will have no impact on the ecological integrity of the prospecting area. However, following the desktop assessment and site sensitivity verification outcome (<b>Appendix D – Site Sensitivity Verification</b>), areas to avoid, or no-go sites have been defined within the prospecting right area.</p> <p>The identified sensitivities are defined and mapped and attached as <b>Appendix C – Site Layout Plan, Sensitivities, and Land Use</b>.</p> <p>In the event of a change in the scope (i.e. intrusive prospecting), further assessment will be required, including the consideration of these listed questions.</p>
1.3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
1.4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	
1.5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
1.6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	
1.7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	
1.7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	
1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	



1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts?	See <b>Section iv).</b>	
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	See <b>Section p).</b>	
1.8.2	What is the level of risk associated with the limits of current knowledge?		
1.8.2	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	See <b>Section iv).</b>	
1.9	How will the ecological impacts resulting from this development impact on people's environmental right in terms following:		
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	<b>Potential Negative (s)</b> – although no activities or impacts have been defined by this assessment, the potential future mining within the proposed prospecting right area will have definite impact on the defined sensitivities. The significance thereof can only be determined following the required Scoping and Environmental Impact Assessment (S&EIA) as defined in the NEMA 2014 EIA Regulations. The potential impacts or risks defined in this assessment should however be used as the baseline determination to avoid, mitigate and manage the identified potential risks associated with future mining activities.	
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	<b>Potential Positive (s)</b> – although no physical job creation will result from the non-invasive prospecting, the potential job opportunities and much needed economic support to the local GDP associated with future mining, may alleviate to some extent poverty, crime, and the increasing unemployment rate observed throughout the district.	
1.10	Describe the linkages and dependencies (between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	See <b>Section iv).</b>	
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives /targets /considerations of the area?		
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	See <b>Sections g), h), and i).</b>	
1.13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	See <b>Section iv).</b>	

Table 6: Questions indicated how the proposed development justified economic and social development

QUESTION		ANSWER	CROSS-REFERENCE
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:	See <b>Section F.3.</b>	
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,		
2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),		
2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and		



2.1.4	Municipal Economic Development Strategy ("LED Strategy").		
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?		
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?		
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?		
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?		
2.5	In terms of location, describe how the placement of the proposed development will:		
2.5.1	result in the creation of residential and employment opportunities in close proximity to or integrated with each other,		
2.5.2	reduce the need for transport of people and goods,		
2.5.3	result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),		
2.5.4	compliment other uses in the area,		
2.5.5	be in line with the planning for the area,		
2.5.6	for urban related development, make use of underutilised land available with the urban edge,		
2.5.7	optimise the use of existing resources and infrastructure,		
2.5.8	opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),		
2.5.9	discourage "urban sprawl" and contribute to compaction/densification,		
2.5.10	contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,		
2.5.11	encourage environmentally sustainable land development practices and processes,		
2.5.12	take into account special locational factors that might favour the specific location (e.g. the location of a strategic prospecting resource, access to the port, access to rail, etc.),		
2.5.13	the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),		
2.5.14	impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and		
2.5.15	in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?		
2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?		
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?		
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability, and sustainability) associated with the limits of current knowledge?		

No physical job creation will result from the non-invasive prospecting. However, the potential prospect of job opportunities and much needed economic support to the local GDP associated with future mining, may alleviate to some extent poverty, crime, and the increasing unemployment rate observed throughout the district.

In the event of a change in the scope (i.e. intrusive prospecting activities), further assessment will be required, including the consideration of these listed questions.



2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?		
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:		
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?		
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?		
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?		
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?		
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?		
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?		
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?		
2.13	What measures were taken to:		
2.13.1	ensure the participation of all interested and affected parties,		
2.13.2	provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,		
2.13.3	ensure participation by vulnerable and disadvantaged persons,		
2.13.4	promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means		
2.13.5	ensure openness and transparency, and access to information in terms of the process,		
2.13.6	ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,		
2.13.7	ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?		
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of		



	low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?		
2.15	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?		
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:		
2.16.1	the number of temporary versus permanent jobs that will be created,		
2.16.2	whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),		
2.16.3	the distance from where labourers will have to travel,		
2.16.4	the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and		
2.16.5	the opportunity costs in terms of job creation (e.g. a prospecting might create 100 jobs, but impact on 1000 agricultural jobs, etc.).		
2.17	What measures were taken to ensure:		
2.17.1	that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and		
2.17.2	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?		
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?		
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?		
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?		
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?		
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?		

#### 4.5 NEED AND DESIRABILITY STATEMENT

Considering the previous sections, the following statement(s) can be made with regards to the "Need and Desirability" of the proposed non-invasive prospecting right application:



- The end result of a prospecting right is to determine the financial feasibility to continue with mining of the available resources. Intensive historical prospecting data is available which supports the non-invasive prospecting method proposed.
- From a socio-economic perspective, the recorded status of unemployment, available job opportunities, and education, to list a few, highlights the need to further develop the mining sector within the FTLM. The prospect of developing a future mine, following the positive feasibility outcome of the proposed non-invasive prospecting associated with this application therefore is supported by the municipal's IDP.
- The proposed non-invasive nature of the prospecting right application results in no impacts. However, following the desktop assessment and site sensitivity verification outcome (**Appendix D – Site Sensitivity Verification**), areas to avoid, or no-go sites have been defined within the prospecting right area. The identified sensitivities are defined and mapped and attached as **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.



## G) MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE

Due to the non-invasive nature of the proposed prospecting activities, i.e. desktop prospecting with no planned drilling, excavations or trenching, no alternatives were assessed as part of the BA process.

However, following the desktop assessment and site sensitivity verification outcome (**Appendix D – Site Sensitivity Verification**), areas to avoid, or no-go sites have been defined within the prospecting right area.

The identified sensitivities are defined and mapped and attached as **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

## H) FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE

(NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout)

As mentioned throughout this report, due to the non-invasive nature of the proposed prospecting activities, a desktop assessment and site sensitivity verification in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020), was completed and are attached to this report as **Appendix D – Site Sensitivity Verification**.

As a result, a number of sensitivities within the proposed prospecting right area are defined (**Appendix C – Site Layout Plan, Sensitivities, and Land Use**).

The defined sensitivities should be considered as “no-go” areas or “areas requiring further investigation”, should the proposed scope associated with this prospecting right change, i.e. intrusive prospecting. In the event of change in scope, a detailed alternative assessment, taking into consideration the defined sensitivities, must be conducted and be in line with the <sup>2</sup>NEMA 2014 EIA Regulations (as amended).

### i) DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED

(With reference to the site plan provided as Appendix C and the location of the individual activities on site, provide details of the alternatives considered in respect to: (a) the property on which or location where the proposed to undertake the activity; (b) the type of activity to be undertaken ;(c) the design or layout of the activity; (d) the technology to be used in the activity; (e) the operational aspects of the activity; and (f) the option of not implementing the activity.)

With reference to **Section g) and h)**, the following details alternatives considered as part of the BA process related to the non-invasive prospecting right application:

#### **(A) PROPERTY ON WHICH OR LOCATION WHERE THE PROPOSED ACTIVITY IS TO BE UNDERTAKEN**

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<sup>2</sup> Should the applicant which to conduct any form of intrusive prospecting, the applicability of Regulation 31 of NEMA 2014 EIA Regulations (Part 2 amendment of Environmental Authorisation, where a change in scope occurs) should be assessed by a Registered EAP.





No property alternatives were considered as extensive available prospecting data from previous diamond core drilling in the area, are associated specifically with Farm Mareesburg 8 JT.

**(B) TYPE OF ACTIVITY TO BE UNDERTAKEN**

No alternative prospecting methods were assessed as part of this BA process. This assessment process only relates to non-invasive prospecting.

**(C) THE DESIGN OR LAYOUT OF THE ACTIVITY**

No design or layout alternatives were considered. A number of sensitivities within the proposed prospecting right area are defined (**Appendix C – Site Layout Plan, Sensitivities, and Land Use**).

The defined sensitivities should be considered as “no-go” areas or “areas requiring further investigation and assessment”, should the proposed scope associated with this prospecting right change, i.e. intrusive prospecting.

**(D) THE TECHNOLOGY TO BE USED IN THE ACTIVITY**

No technology alternatives were considered.

The non-invasive nature of the proposed prospecting will include the tracing and purchasing of available geological data. This data includes geological maps, geochemical and geophysical surveys, gravimetric, radiometric, magnetic, seismic data, remote sensing data, borehole data, and any information pertaining to previous invasive or non-invasive exploration. Following the gathering of data, relevant information will be analysed and modelled in 2D and 3D digital geological models and will form the basis for the resource calculations.

**(E) THE OPERATIONAL ASPECTS OF THE ACTIVITY**

As the non-invasive prospecting only relates to desktop studies and in field observations, no operational alternatives were assessed.

**(F) THE OPTION OF NOT IMPLEMENTING THE ACTIVITY**

In the event of change in scope, a detailed alternative assessment, taking into consideration the defined sensitivities, must be conducted and be in line with the NEMA 2014 EIA Regulations (as amended). Following the defined change in scope, a site layout plan is required to be assessed. In the event of the prospecting activities being intrusive, the sensitivities as define during this site sensitivity verification should be considered as potential “no-go” areas or “areas requiring further investigation and assessment”.

**ii) DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED**

*(Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.)*



Enviroroots (Pty) Ltd was appointed by Environmental Management Assistance (Pty) Ltd on behalf of Nomamix (Pty) Ltd to assist in conducting and managing the required Public Participation Process (PPP) required as part of the Basic Assessment (BA) Process.

For the purpose of this section a summary of steps taken to date will be provided. The detailed PPP report and associated records is attached as **Appendix E – Public Participation**.

### **Identification of I&AP**

The following groups were identified as potential Interested and Affected Parties (I&APs):

- Relevant National Government Departments;
- Relevant Provincial Government Departments;
- Relevant Municipal Representatives;
- Relevant Ward Councillors;
- Landowners/Occupiers;
- Adjacent Landowners/Occupiers;
- Relevant Institutional/Organisational Representatives;
- Surrounding Mining Activities;
- Land Claimants; and
- Governmental and Non-Governmental Organisations and Agencies.

To ensure that all potential I&APs were made aware of the project and had the opportunity to register and provide comments, the notification process was as thorough as possible. Registration will remain open throughout the Public Participation Process to allow Interested and Affected Parties to register and submit their input throughout.

### **Notification of I&APs**

#### **Site Notices**

To inform surrounding and immediate community members, landowners, occupiers, workers and passers-by of the proposed project and to invite registrations and comments, site notices will be erected at a visible and accessible localities throughout the study area on 08 September 2022. These notices will be strategically erected along access routes throughout the study area.

#### **Newspaper Advertisements**

To inform a broad spectrum of individuals who might want to register as I&APs, newspaper advertisements (one English and one Sepedi) will be placed in the Sekhukhune Times and the Steelburger News respectively on Thursday, 08 September 2022. Proof of the advertisements placed will be attached to the final PPP Report.

### **Written Notifications**



Identified I&APs will be directly informed of the application processes to be followed by means of email, hand delivery, registered post, and text message (where no other means of communication is possible). Proof of written notifications sent will be attached to the Final Public Participation Report for submission. Note that the written notifications will encourage potential I&APs to register and provide their comments/questions on the proposed project and related application processes currently underway.

#### **Notification of I&AP's of reports availability**

Registered I&APs will be notified of the availability of the Draft Basic Assessment Report for Public Commenting as and when required. I&APs will be informed of the relevant commenting period and will be encouraged to submit any comments or questions on or before the closing date (to be confirmed).

#### **Access and Commenting Opportunity**

Commenting and Registration opportunity will be provided for throughout this Public Participation Process. The entire process will remain transparent and allow for I&APs to register and comment throughout. The process will be conducted in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) which indicates that any public participation process must be conducted for a period of at least 30 days. Hard copies of the Draft documents will be placed at a relevant public entity and will be provided to the relevant Departments/Institutions/Organisations requiring hard copies of the documents. Further to this, an electronic copy of the draft documents will be uploaded onto the Environmental Management Assistance (Pty) Ltd Website.

#### **Regulatory Consultation**

Commenting Authorities include the following:

- Department of Forestry, Fisheries and the Environment;
- Department of Water and Sanitation;
- Department of Mineral Resources and Energy;
- Department of Agriculture, Land Reform and Rural Development;
- Limpopo Department of Economic Development, Environment and Tourism;
- Fetatoma Greater Tubatse Local Municipality;
- Sekukhune District Municipality; and
- South African Heritage Resources Agency.

#### **Disclosure of I&AP Interests**

Registered I&APs were informed that this process is a PUBLIC PROCESS. All comments and/or questions received from I&APs on this process is considered public knowledge. In accordance with the Environmental Impact Assessment Regulations and the Regulations regarding the procedural requirements for Water Use Applications and Appeals, EnviroRoots (Pty) Ltd will not keep any information of this nature confidential and will submit all comments and/or questions received to the Regulatory Authority in a verbatim manner as far as possible.



By registering as an I&AP and providing comments, I&APs consent to the above. Note that no contact information for I&APs will be made available to the public at any point during the process. However, names and surnames will accompany comments in the Comments and Responses Report (C&RR) to form part of this process. I&APs were requested to inform EnviroRoots if they would prefer their name and surname to not accompany their comments.

This Public Participation Process is conducted in accordance with Section 11(1)(c) of the Protection of Personal Information Act, 2013 (Act No. 4 of 2013), which allows for the processing of personal information if processing complies with an obligation imposed by law on the responsible party and in accordance with Section 11(1)(f) of the Act which allows for the processing of personal information if processing is necessary for pursuing the legitimate interests of the responsible party or of a third party to whom the information is supplied.

### **Registrations and Comments Received**

Identified I&APs will be encouraged to submit their registrations and comments to EnviroRoots for them to receive further correspondence regarding the proposed project currently underway. Comments and registrations received via all methods (Registration Forms/email/telephonic/public participation meeting) will be captured and will be provided in the Final Basic Assessment Report for submission to the relevant Departments.

### **Addressing Comments and Concerns**

A Comments and Responses Report (C&RR) will be compiled as part of the Public Participation Process. This document will record the issues of concern, questions and suggestions contributed by stakeholders during the course of the Basic Assessment Report Process. This report will also include the responses provided by relevant parties. It should be noted that the Comments and Responses Report is an active document which will be updated throughout the process as comments and concerns are received. However, following submission of all final documents to the Department of Mineral Resources and Energy, all additional comments should be directed directly to the Department.

### **Notifying I&AP of the Decision**

Following the verdict by the DMRE on whether to grant or reject the Environmental Authorisation Application, all registered I&APs will be informed of the decision and the appeal process and its timeframes for submission, if applicable.



### iii) SUMMARY OF ISSUES RAISED BY I&AP

(Complete the table summarising comments and issues raised, and reaction to those responses)

**Table 7** provides the summary of comments and issues raised to date.

Table 7: Summary of comments and issues raised

Interested and Affected Parties	Date Comments Received	Issues raised (Verbatim unless specified otherwise)	EAPs response to issues as mandated by the applicant (Verbatim unless specified otherwise)
<b>AFFECTED PARTIES</b>			
<b>LANDOWNER/S</b>			
<b>LAWFUL OCCUPIER/S OF THE LAND</b>			
<b>LANDOWNERS OR LAWFUL OCCUPIERS ON ADJACENT PROPERTIES</b>			
<b>MUNICIPAL COUNCILLOR</b>			
<b>MUNICIPALITY</b>			
<b>ORGANS OF STATE (RESPONSIBLE FOR INFRASTRUCTURE THAT MAY BE AFFECTED ROADS DEPARTMENT, ESKOM, TELKOM, DWS ETC.)</b>			
<b>COMMUNITIES</b>			
<b>DEPT. LAND AFFAIRS</b>			
<b>TRADITIONAL LEADERS</b>			
<b>DEPT. ENVIRONMENTAL AFFAIRS</b>			
<b>OTHER COMPETENT AUTHORITIES AFFECTED</b>			



Interested and Affected Parties	Date Comments Received	Issues raised (Verbatim unless specified otherwise)	EAPs response to issues as mandated by the applicant (Verbatim unless specified otherwise)
<b>OTHER AFFECTED PARTIES</b>			
<b>INTERESTED PARTIES</b>			



## I) THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

(The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

The section to follow describes the environmental attributes associated with the proposed prospecting right application area from a desktop or baseline perspective.

### (1) BASELINE ENVIRONMENT

#### (a) TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

(Its current geographical, physical, biological, socio-economic and cultural character)

## I. OVERVIEW OF THE GENERAL ENVIRONMENT

### a. CLIMATE

The climate of the Sekhukhune District varies. The northern and western regions of the area experience a hot and semi-arid climate. The southern and eastern regions are more humid and slightly cooler. The Sekhukhune District receives summer rainfall.

#### Temperature

The average yearly temperature (refer to **Figure 1**) for the project area ranges from 22 to 36 °C (high) and 3 to 19 °C (Low). The study area is situated in a subtropical highland climate or temperate oceanic climate with dry winters (Cwb), as per the Köppen Climate Classification (Kottek, et al., 2006). The project area receives summer rainfall.

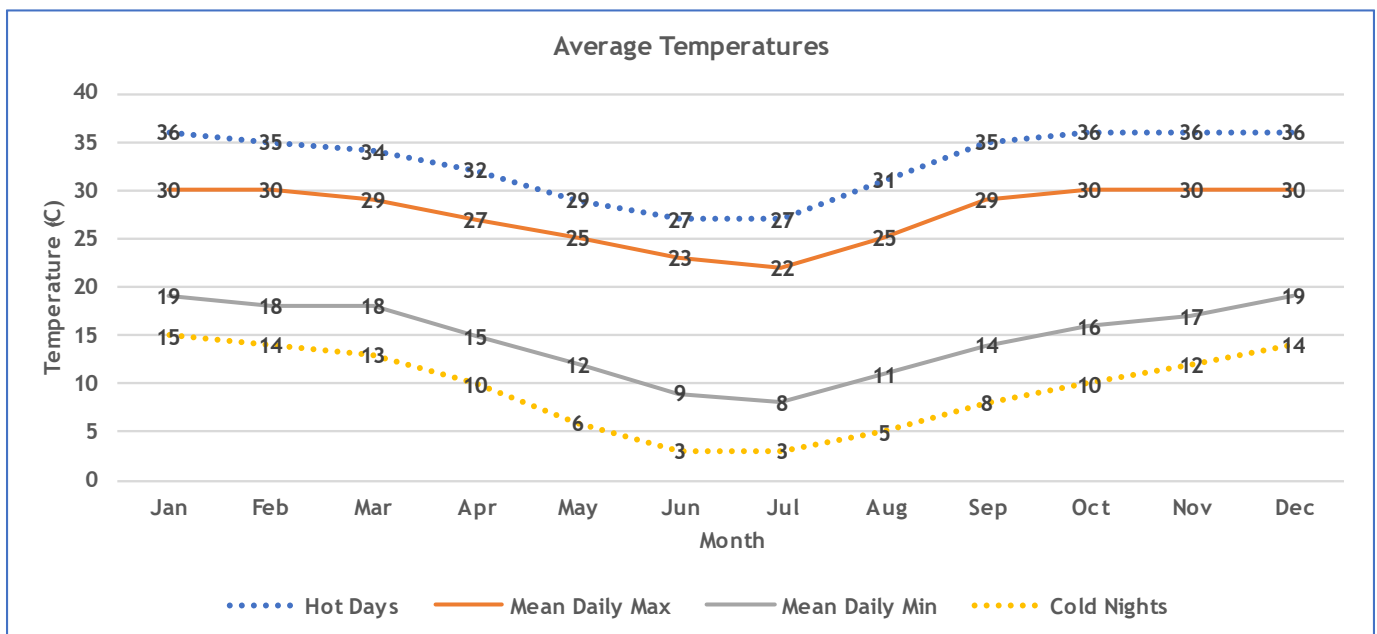


Figure 1: Average temperatures and precipitation for SD (source: (Meteoblue, 2022)

#### Wind speed and direction

**Figure 2** shows the wind rose for the project area and presents the number of hours per year the wind blows from the indicated direction. The wind blows from North-North-East, North-East, East-North -East, North and East more often, at velocities ranging

from 1 km/hr to 28 km/hr; and from other directions but less frequently. Precipitation intensity during wind will likely cause precipitation intensity changes on slopes perpendicular to the wind direction, throughout the year.

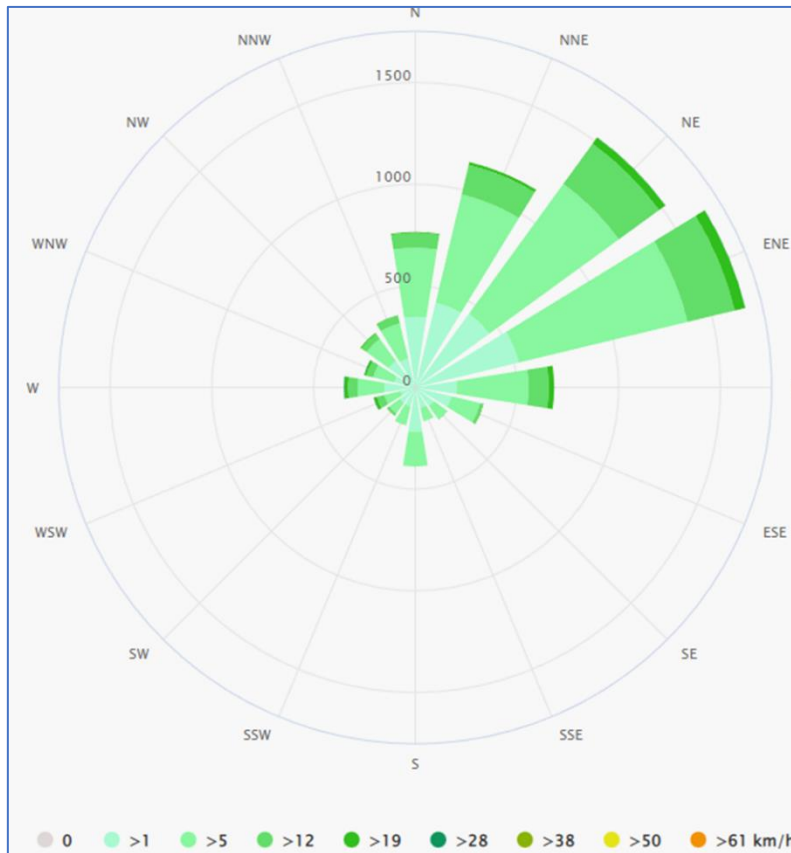


Figure 2: Wind rose for Sekhukhune (Meteoblue, 2022)

### **Rainfall and evaporation**

Available rainfall data suggest a Mean Annual Precipitation (MAP) ranging from 427 (30th percentile) to 1209 (90th percentile) mm/yr. The average rainfall is in the order of 686 mm/yr. The project area falls within evaporation zone 4A, of which Mean Annual Evaporation (MAE) ranges from 1 300 to 1 400 mm/yr. The MAE far exceeds the MAP for the site, which implies greater evaporative losses when compared to incident rainfall. Monthly evapotranspiration for the site is likely to be distributed as shown in **Figure 3**.



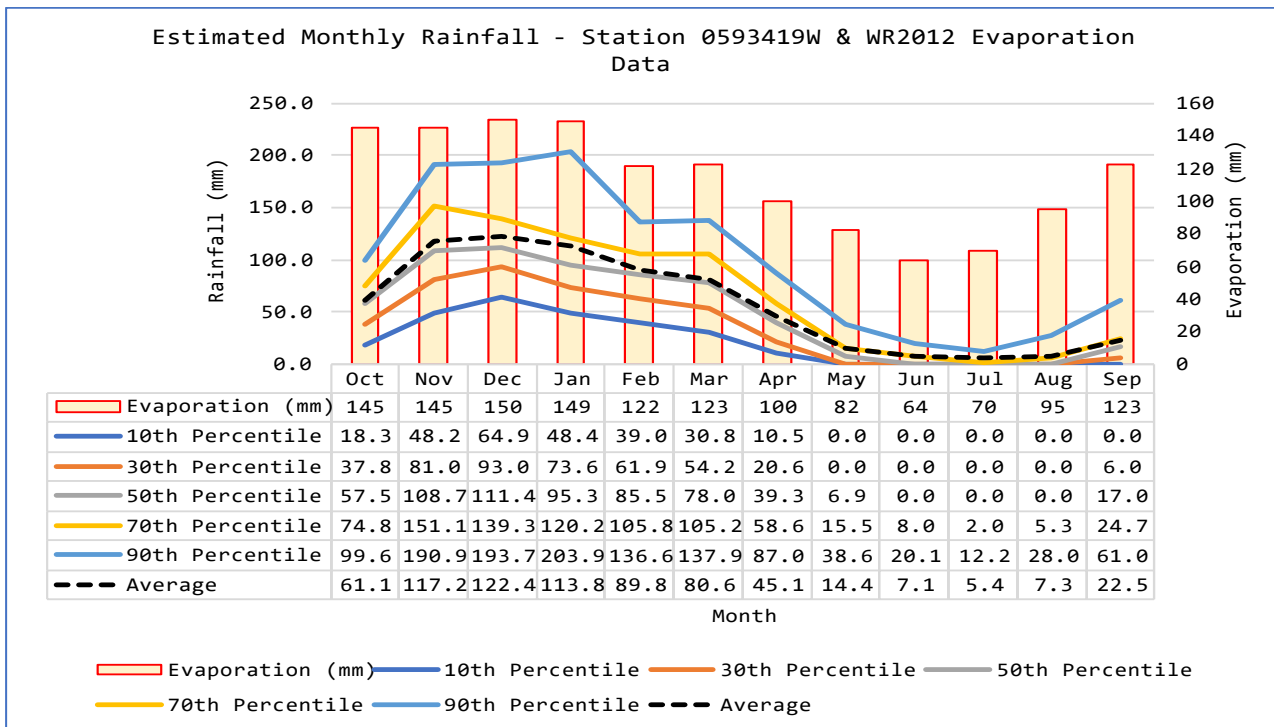


Figure 3: Average rainfall for Station 0593419W & WR2012 evaporation

## II. AGRICULTURAL AND SOIL

Zimpande (Pty) Ltd was appointed by Environmental Management Assistance (Pty) Ltd on behalf of Nomamix (Pty) Ltd to conduct a baseline soil and agricultural potential assessment and to conduct the required desktop and site verification.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.1 – Agriculture and Soil Assessment**.

### a. SUMMARY OF DESKTOP ASSESSMENT

Various databases were consulted to determine the desktop baseline associated with the proposed non-invasive prospecting right. **Table 8** provides a summary of the background information related to soil from the databases.

Table 8: Desktop based soil background information sourced from various databases

PARAMETERS	DESCRIPTION
Mean Annual precipitation (MAP)	Majority of the study area is dominated by 601 – 800 mm of rainfall per annum and the remaining north western portion is dominated by 401 - 600 mm of rainfall per annum. These conditions have a fair to low yield potential for a moderate range of adapted crops but planting date options are limited for supporting rain fed agriculture.
Mean Annual Evaporation (MAE)	2201 – 2400 mm for the western portion of the study area, 2001 – 2200 mm for the eastern portion of the study area and 1801 – 2000 mm for the far western tip of the study area. Moisture deficit may be a problem for non-irrigated crops.
Geology	Rustenburg, Lebowa and Rashedo formations
Soil pH	Slightly acidic to acidic with pH range of 5.5 - 6.4. Certain critical plant nutrients may not be available for uptake and the acidic soil pH may need to be ameliorated.



Land Type Data	The dominant land types within the study area is the Dominated by Ib31/Ib154 (Rocky areas with miscellaneous soils), to a lesser extent is there Dc31 (dominated by Pedocutanic, Prismacutanic and Vertic/Melanic horizon) and Ab29 (Red/yellow soils freely drained which are dystrophic and/or mesotrophic). ( <b>Figure 4</b> )
Desktop land capability	The majority of the study area is characterised by non-arable land (Wilderness Class VIII), followed by moderate potential arable land (Arable Class III) along the south eastern portion of the study area and lastly non-arable land (Wilderness Class VIII) and to a lesser extent marginal potential land (Grazing Class VI). The arable soils are moderately suitable for cultivation. ( <b>Figure 5</b> )
Desktop Grazing Capacity	Most of the study area is characterised by the grazing capacity of 8 – 10 hectares per Livestock Unit (ha/LSU) and the remaining western portion of 5 – 7 (ha/LSU). Small portions on the north and south of the study area are characterised by 11 – 13 (ha/LSU). The study area is suitable to support moderate to limited grazing activities. ( <b>Figure 6</b> )
Water Retaining Capacity of the soil	Scarce or absent
Alkalinity and Sodidity of the soils	The soils are neither alkaline or sodic, this indicates soils are not affected by high concentration of salts
Predicted soil loss	High for majority of the study area and Low towards the eastern portion of the study area. ( <b>Figure 7</b> )
Screening Tool Analysis	High Sensitivity to Agriculture

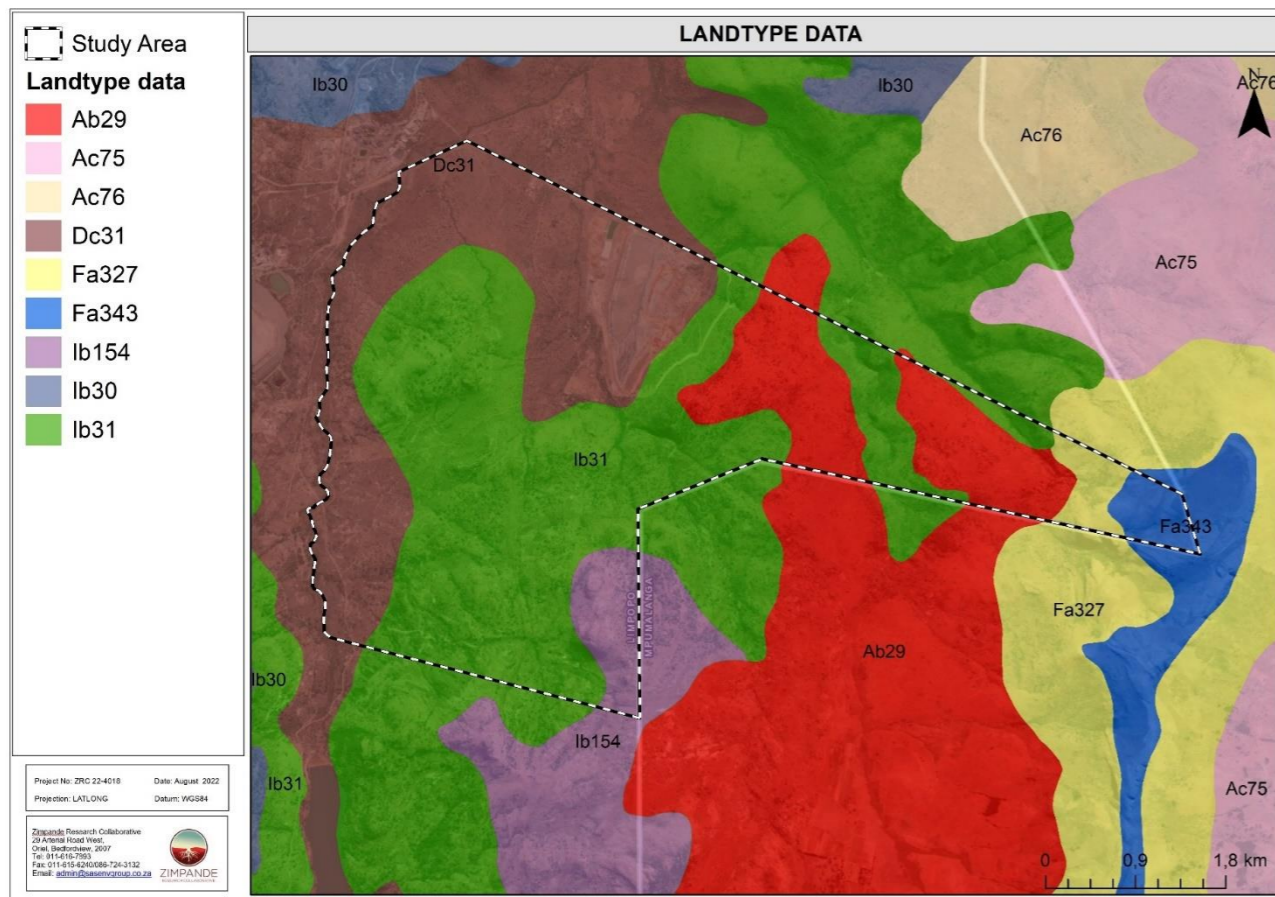


Figure 4: Land type data associated with the study area

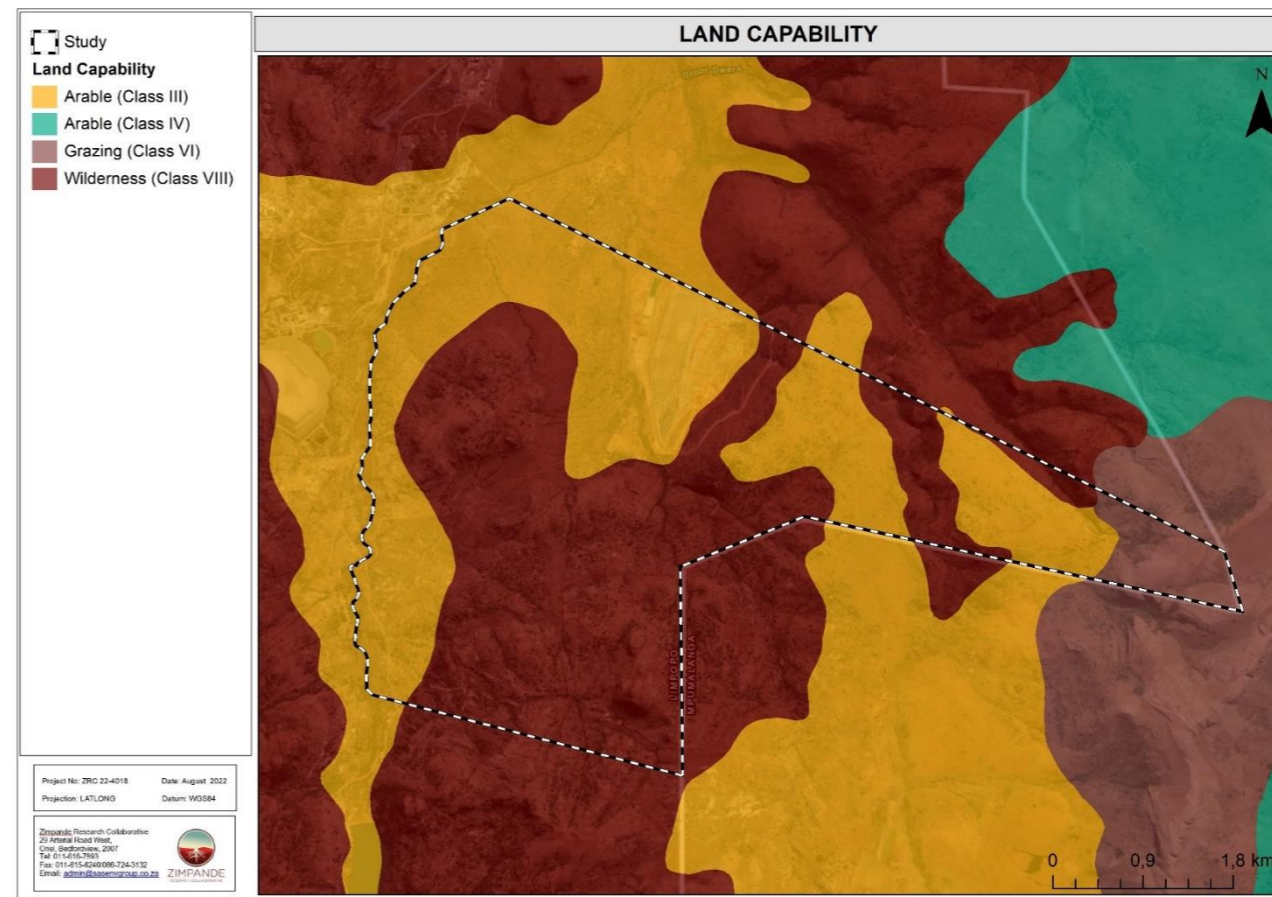


Figure 5: Desktop land capability associated with the study area

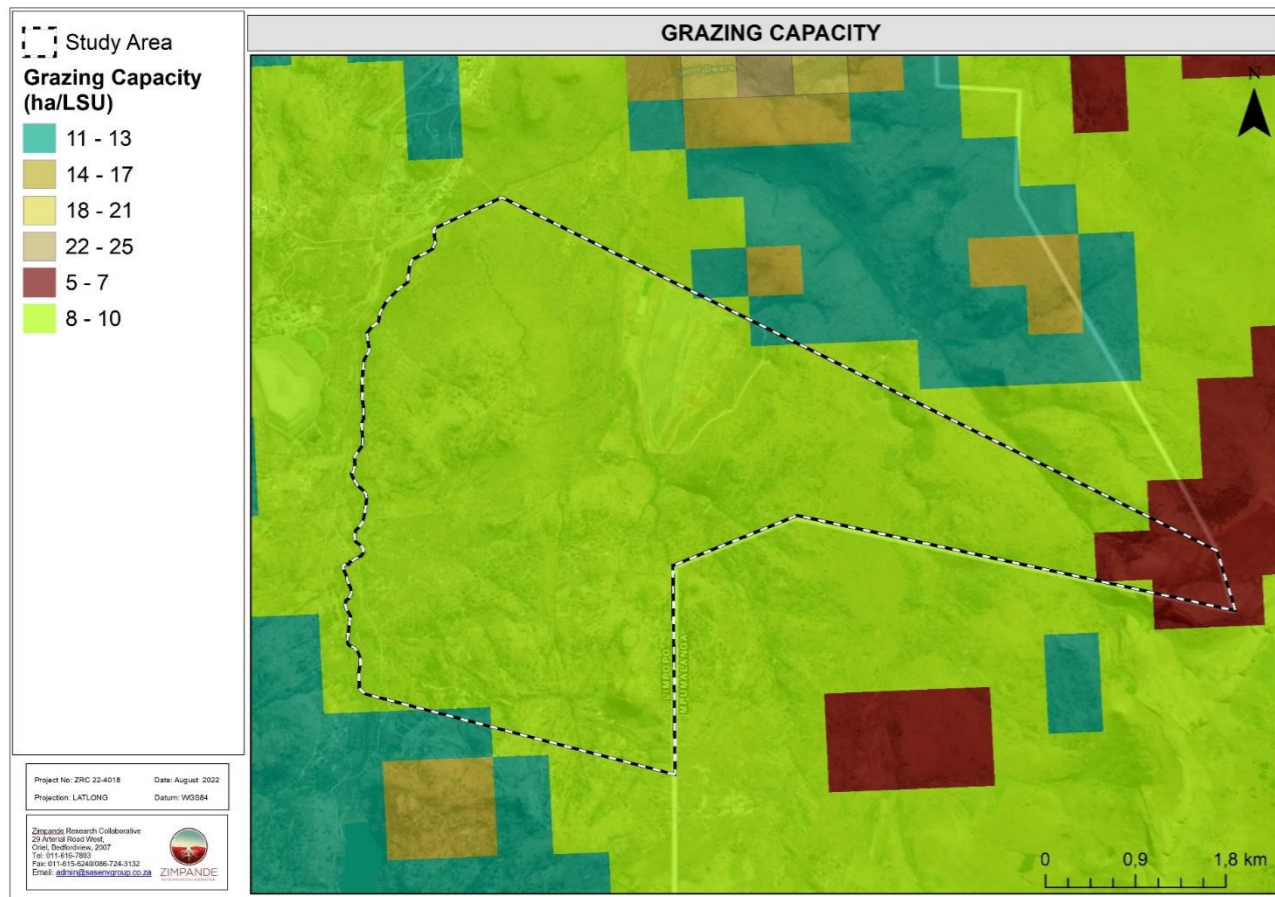


Figure 6: Grazing capacity associated with the study area

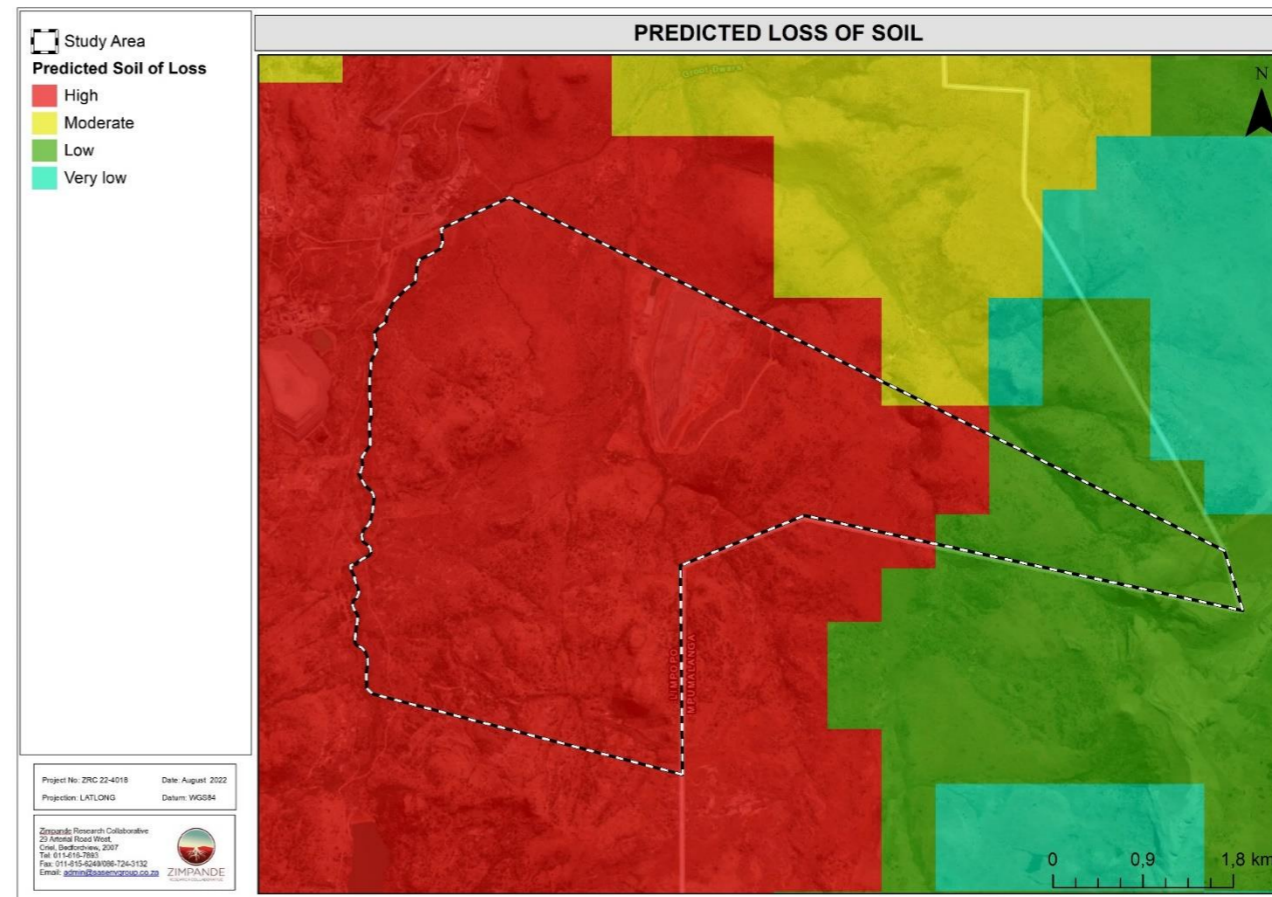



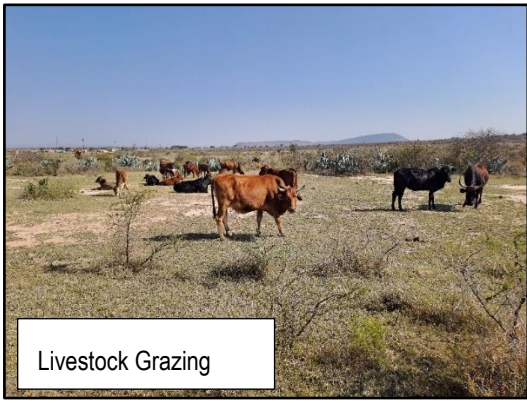




Figure 7: Predicted soil loss associated with the study area

b. VERIFICATION OUTCOME

**Verified Land Use**

According to observations made during the site assessment the study area is dominated by open veld or vacant areas (often utilised for grazing by the locals and as habitat for wildlife) while the northern portion is comprised of mining related activities. During the time of assessment, no large scale cultivation of crops was observed. **Table 9** below depicts the dominant land uses associated with the study area.

Table 9: Photographs illustrating the dominant land use within the study area

DOMINANT LAND USES	
 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Vacant Areas</p>	 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Livestock Grazing</p>
 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Wildlife</p>	 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Wildlife</p>
 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Wildlife habitat</p>	 <p style="text-align: center; background-color: white; border: 1px solid black; padding: 5px;">Mining Activities (TSF)</p>

**Verified Soil Forms**

The identified soil forms within the study area include the shallow soil of the Mispah/Glenrosa, Mayo, Darnall/Swartland, Steendal/Immerpan, Dundee, Didema, Rocky Outcrops and the Witbank formation. Of these identified soils, the Rocky Outcrops comprising of the Mispah/Glenrosa and the Mispah/Mayo soil forms were the dominant soil forms within the study area.



The Mispah/Glenrosa and rock outcrops are typically shallow to no topsoil (rocky outcrops) in nature. These soils are characterised by spatial heterogeneity associated with weathering of the rock material, illuviation, and biotic disturbance (plants and animals) especially along the joints or bedding planes which results in the mixing of soil and rock material in some instances. The topsoil horizon can occur as a single shallow surface horizon with diagnostic red or yellow brown colours and are accommodated within the Mispah/Glenrosa formations. These types of soils are usually avoided for intensive use and thus left for grazing, forestry, and wildlife land uses since they do not present adequate soil depth for most cultivated crops.

The soils of duplex character such as the Darnall/Swartland formation are characterised by moderately to strongly structured soils with a clear textural distinction between a sandier surface horizon and a higher clay upper subsurface horizon. These types of soils are typically not preferred for cultivation due to the high clay content, strong structure and are prone to waterlogging (highly impermeable when wet). Waterlogging conditions make these soils prone experiencing runoff during high rainfall events and thus the formation of erosion gullies over time. Nonetheless, should these soils be cultivated, intensive management practices would be required.

Soils of melanic character such as the Bonheim/Mayo and Steendal/Immerpan formations are characterised by dark coloured and strongly structured morphology with a high base status and low organic carbon content ( less than 10%). These soils are typically encountered along intermediate rocks or in lower terrain positions to receive additional bases via lateral flowpaths. The Steendal/Immerpan soils occur in mostly arid areas owing to the cementation of the calcium and gypsum materials due to the high evaporation demand. Beside depth limitations of these soils as encountered within the study area these soils are fertile but may require irrigation to be highly productive.

The Didema soil form is characterised by topsoil accumulation of organic matter (in various stages of decomposition with dark brown or black morphology) under saturated conditions underlain by hard rock. These soils are typical of high-altitude plateaux and mountainous regions as topsoil layers. The surface horizon typically contains an average of between 10 and 20% organic carbon.

The Dundee soils form is associated with watercourses due to the unconsolidated soil material as a result of deposition by water. These soils are characterised by little evidence of pedogenic horizonation and the presence of clear stratifications may be observed. These soils may contain weathered hard rock fragments sometimes identified as pebbles. These soils typically occur on low lying terrain positions.

The Witbank (Anthrosols) soil forms are soils which have been subjected to physical disturbance because of human interventions. Such interventions include transportation and deposition of the earth material containing soil. As a result, these soils are not ideal for agricultural cultivation.

**Table 10** provides the summary of the identified and verified soil forms within the study area and **Figure 8** map the dominant soil.

*Table 10: Identified soil forms associated with the study area.*

SOIL FORM	DIAGNOSTIC HORIZONS
Bonheim/Mayo	Melanic A/Pedocutanic B or Lithic
Darnall/Swartland	Orthic A or Melanic A/ Pedocutanic B/Lithic
Didema	Organic O/Lithic
Dundee	Orthic A/Alluvial or Alluvial
Mayo	Melanic A/Lithic

Mispah/Glenrosa	Orthic A/Lithic or Hard Rock
Swartland/Darnall	Orthic/ Pedocutanic B/ Lithic or Hard Rock
Steendaal/Immerpan	Melanic A/Soft Carbonate or Hard Carbonate
Rocky Outcrops	Solid rock
Witbank	Transported Technosols

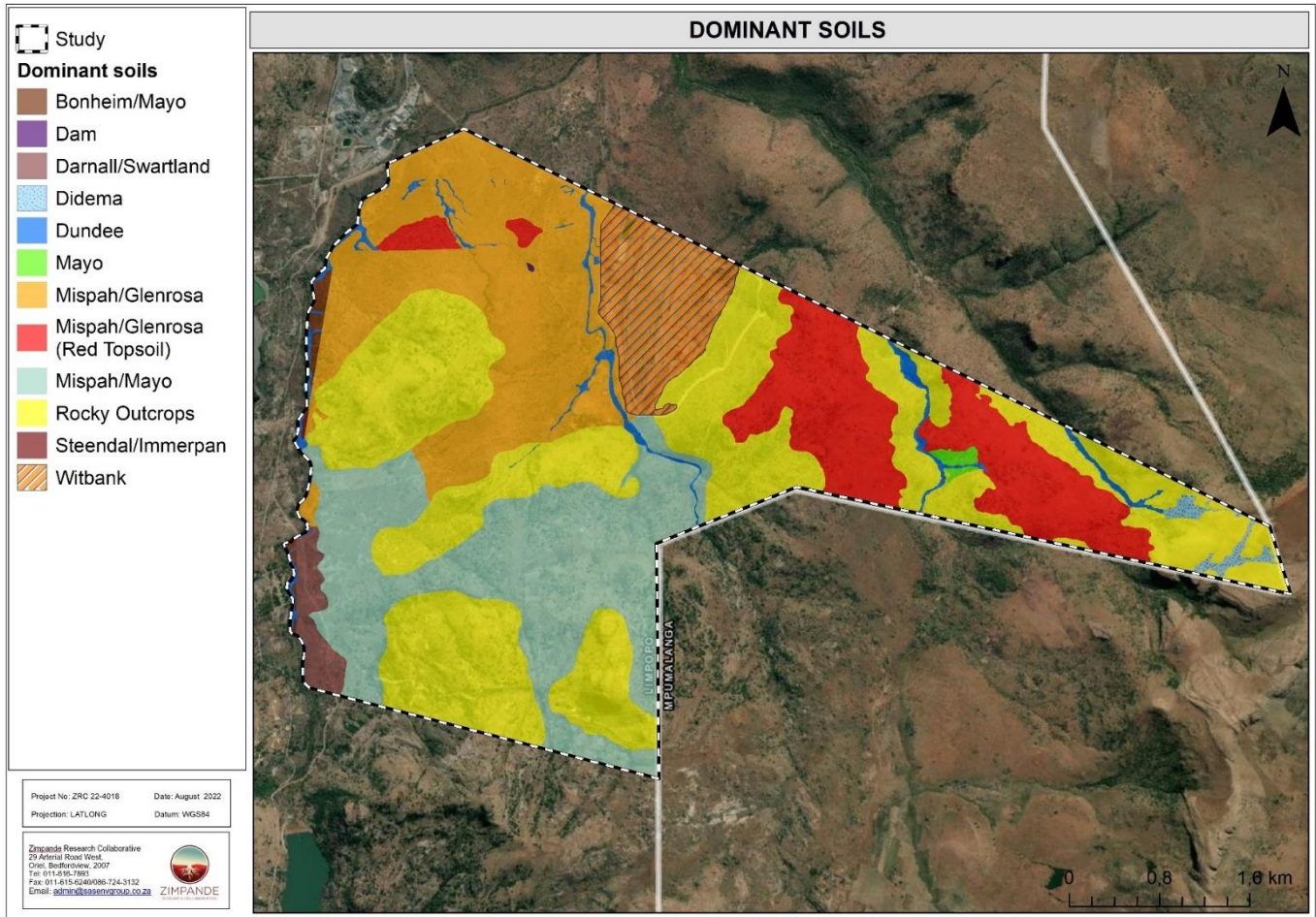


Figure 8: Dominant soil forms associated with the study area

**Verified Land Capability Classification**

In the South Africa context, agricultural land capability is generally restricted by climatic conditions, particularly water availability. However, even within similar climatic zones, different soil types typically have different land use capabilities attributed to their inherent characteristics.

High potential agricultural land is defined as having the soil and terrain quality, growing season and adequate available moisture supply needed to produce sustained economically high crops yields when treated and managed according to best possible farming practices (Scotney *et al.*, 1987). For the purpose of this assessment, land capability was inferred in consideration of observed limitations to land use due to physical soil properties and prevailing climatic conditions. Climate Capability (measured on a scale of 1 to 8) was therefore considered in the agricultural potential classification. The study area falls into Climate Capability Class 5 at best, with moderate to severe limitations for arable crops. **Table 11** and **Figure 9** below presents the identified soil forms with their respective land capability. **Figure 10** presents the soil potential associated with the soils. The dashboards



presented from **Table 12** to **Table 15** below present the land capability of the identified soil forms in a summarised and comprehensive manner.

*Table 11: Land capability associated with the soils occurring within the study area.*

Soil Form	Land Capability
Darnall/Swartland	Arable (Class IV)
Didema	Wetland (Class V)
Dundee	Watercourse (Class V)
Bonheim/Mayo	Grazing (Class VI)
Mayo	
Mispah/Glenrosa	
Steendaal/Immerpan	
Rocky Outcrops	Wilderness (Class VIII)
Witbank	

Table 12: Summary discussion of Arable (Class IV) land capability class for the Swartland and Darnall soil forms

LAND CAPABILITY: ARABLE - CLASS IV			
Occurrence of Swartland/Darnall soil forms within the study area.			
<b>Terrain Morphological Unit (TMU)</b>	Depressional areas, flat and lower lying landscape	<b>Photograph notes</b>	View of the Melanic, Pedocutanic and Lithic horizons associated with the Swartland/ Darnall and Bonheim soil forms occurring within the study area.
<b>Soil Form(s)</b>	Swartland/Darnall and Bonheim		
<b>Diagnostic Horizon Sequence</b>	Melanic A or Orthic A/Pedocutanic/ Lithic	<b>Land Capability</b> The identified soil forms are of moderate (Class IV) land capability, and suitable for arable agricultural land use with restrictions. Therefore, these soils are considered to make a moderate contribution to agricultural productivity on a regional and national scale.	
<b>Physical Limitations</b>	Shallow effective rooting depth in some instances as well as the shrink and swell properties of the topsoil which damages the root system of crops.		
<p><b>Business case and Conclusion:</b> The identified soils are generally not considered significant in terms of agricultural productivity unless under irrigation. These soils are known for their shrinking and expansion characteristics upon wetting and drying thus necessitating intense management practices to be applied, which are usually costly and not economical based on the expected yields from these soils. This is exacerbated by the climate of the area. These soils are thus typically suited for subsistence agriculture for both cropping and grazing.</p>			




Table 13: Summary discussion of the watercourse/wetland (Vclass V) land capability class for the alluvial and wetland soils

LAND CAPABILITY: WATERCOURSE - CLASS V			
View of the Dundee soils form (watercourses) and Didema (wetland) identified.			
<b>Terrain Morphological Unit (TMU)</b>	Valley bottoms and gently landscapes of < 0.5% slope gradient	<b>Photograph notes</b>	View of the identified Didema, Alluvial soils and Montane flowpaths, associated with the watercourses.
<b>Soil Form(s)</b>	Alluvial (Dundee) and Didema		
<b>Diagnostic Horizon Sequence</b>	Orthic/ Alluvial and Organic O/Lithic	<b>Land Capability</b>	These soils were classified as class V land capability due to land use limitations related to their occurrence within a water course. These soils are not considered to contribute significantly to local, provincial and/or national agricultural productivity.
<b>Physical Limitations</b>	These soils are not ideal for cultivation due to their occurrence within watercourses. Furthermore, the lack of soil structure and nutrients disqualifies these soils from commercial agriculture.		

**Business case, Conclusion and Mitigation Requirements:**

Although not considered to be of significant agricultural productivity, these soils are considered of significant value as part of the freshwater habitats, and as such the recommendations and management measures of the freshwater resource assessment report conducted as part of the EIA and WULA process take precedence.

Table 14: Summary discussion of the Grazing (Class VI) land capability class for the shallow lithic soils

LAND CAPABILITY: GRAZING - CLASS VI			
<b>Occurrence of the Mispah/Glenrosa or Mayo soil forms within the study area.</b>			
			
<b>Terrain Morphological Unit (TMU)</b>	Depressional areas and lower lying landscape	<b>Photograph notes</b>	View of the morphology of the identified Mispah/Glenrosa/Mayo soil forms and the rocky outcrops.
<b>Soil Form(s)</b>	Mispah/Glenrosa, Mayo and Rocky Outcrops		
<b>Diagnostic Horizon Sequence</b>	0-35 cm: Melanic A or Orthic A ≥ 35 cm: Hard rock/Lithic	<b>Land Capability</b> The identified Mispah/Glenrosa and Mayo soil forms are of poor (Class VI) land capability and are not suitable for arable agricultural land use. These soils are, at best, suitable for natural pastures for light grazing. Therefore, these soils are not considered to make a substantial contribution to extensive subsistence farming on a local scale.	
<b>Physical Limitations</b>	Shallow effective rooting depth as well as the shrink and swell properties of the top soil which damages the root system of crops.		



**Business case and Conclusion:**

The identified soils are generally not considered to be of significance in terms of agricultural productivity and are better suited for grazing purposes. Despite the low importance in terms of agricultural potential their importance in terms of biodiversity support must be considered.

Table 15: Summary discussion of the Wilderness (Class VIII) land capability class for the rocky outcrops and anthropogenically disturbed soils

LAND CAPABILITY: WILDERNESS - CLASS VIII			
<b>Occurrence of anthropogenically disturbed soils within the study area associated with the TSF.</b>			
<b>Terrain Morphological Unit (TMU)</b>	Very Steep landscapes	<b>Photograph notes</b>	View of the morphology of the identified rocky outcrops and the anthropogenically disturbed soils of the Witbank formation.
<b>Soil Form(s)</b>	Mispah/Glenrosa/Mayo and Witbank		
<b>Diagnostic Horizon Sequence</b>	0 - ≥ 35 cm: Hard rock/Lithic or disturbed	<b>Land Capability</b> The identified Rocky Outcrops are of poor (Class VIII) land capability and are not suitable for arable agricultural land use. These soils are, at best, suitable for natural pastures for light grazing. Therefore, these soils are not considered to make a substantial contribution to extensive subsistence farming on a local scale. The identified Witbank soils associated with anthropogenic disturbance also have very poor (class VIII) land capability attributed to human impacts.	
<b>Physical Limitations</b>	Minimal effective rooting depth for crops is the primary limitation of the land capability of the Rocky Outcrops. Physically disturbed soils which may require rehabilitation before cultivation.		

**Business case and Conclusion:**

The identified rocky outcrops are, at best, suited for grazing and/or wildlife practices. These soils are generally not considered of significant agricultural productivity. These soils, at best are suited for grazing. Despite the low importance in terms of agricultural potential their importance in terms of biodiversity support must be considered. Mitigation measures should this put in place to minimise further disruption of other adjacent soils which can potentially be used for grazing. The current state of these of the Witbank soils will require significant rehabilitation in future especially due to the steep slopes and erodibility of the landscape.

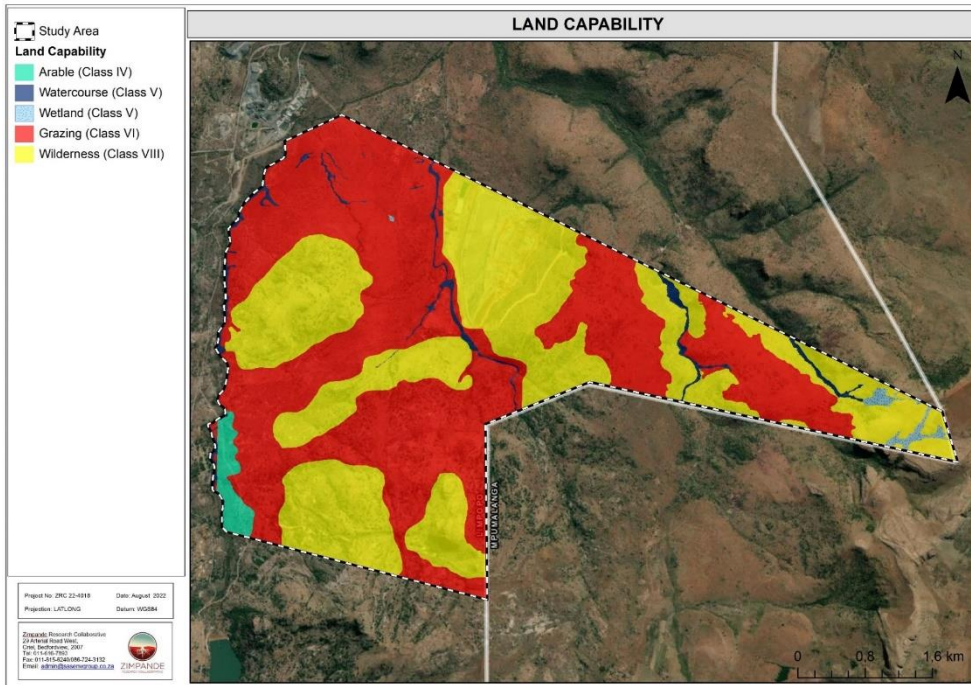


Figure 9: Verified land capability of the soil forms associated with the study area

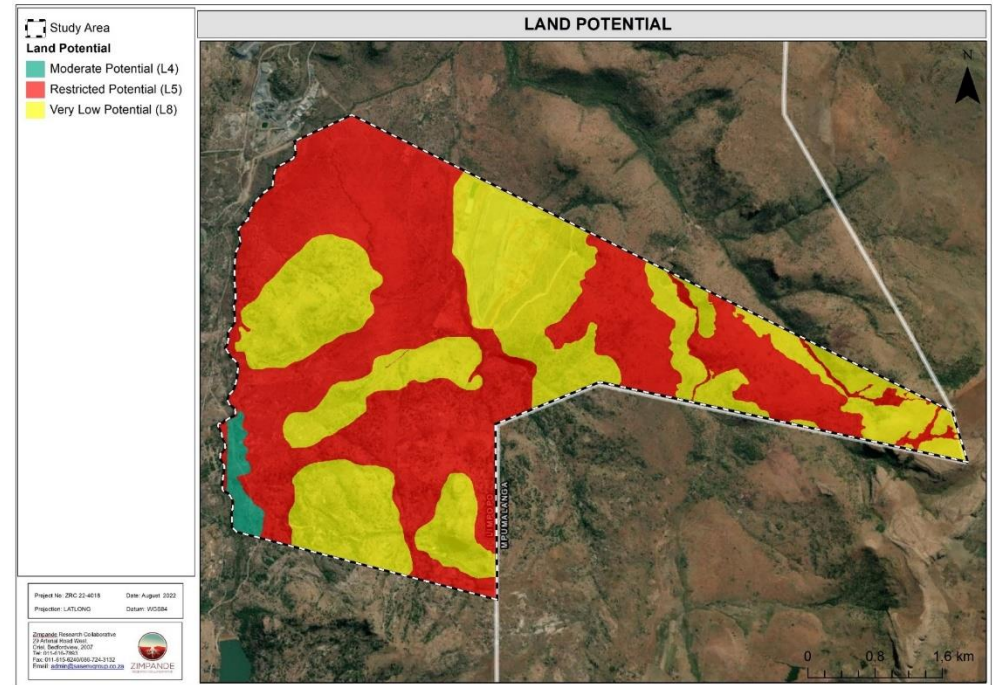


Figure 10: Verified land potential of the soil forms associated with the study area





c. VERIFICATION STATEMENT

The screening tool analysis indicated the study area to be of very high agricultural sensitivity, however the field verified data indicates that the study area is of Low agricultural sensitivity. This can be attributed to the rocky outcrops and shallow soils of the Mispah/Glenrosa formation. These soils are characterised by limited to not available topsoil material which will hinder any proposed cultivation within the study area. Also, these soils typically occur along steep slopes along mountainous areas and thus proving difficult for mechanical handling and if mechanically handled the soils are still prone to erosion. These soils are usually avoided for cultivation and rather used as veld areas for grazing purposes or as wildlife conservation areas.

Table 16: Outcomes of the soil assessment findings

SCREENING TOOL ASSIGNED SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT / PLAN OF STUDY
High for most of the study area.	Majority of the study area is dominated by shallow soils of lithic character soils which are low sensitivity to very low sensitivity.	It is recommended that a detailed Agricultural Impact Assessment must be undertaken in future <b><i>should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on soil resources to result from such prospecting activities.</i></b> This detailed assessment should also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation.

d. IMPACT STATEMENT

The overall impact is anticipated to be low to very low and within acceptable levels from a soil and land capability point of view.

e. REASONED OPINION FOR ISSUING THE EA

Overall, the lithic character (hard to cultivate) of the dominant soils as well as the low and erratic rainfall associated with the study area renders the site not suitable for any commercialised cultivation. However, some of the areas used for grazing may potentially be impacted, which will ultimately impact on the local and regional livestock production to a degree. Although agricultural studies under the CARA Act 1983 prioritise crop cultivated agriculture, it is imperative that land with grazing capability is also conserved where feasible as this will support the highly sensitive faunal ecology of the study area in its present condition and land use. It should be noted that this soil assessment was done at a high level due the low quantum of risk presented by the proposed development and therefore should not be used for any other purpose than it is intended for. Should the quantum of risk of the project change for any reason, then a detailed soil investigation, delineation and classification may have to be undertaken in fulfilment of the applicable legislation.

III. **ARCHAEOLOGICAL, CULTURAL AND PALAEOONTOLOGY**

Beyond Heritage was appointed by Environmental Management Assistance (Pty) Ltd on behalf of Nomamix (Pty) Ltd to conduct a baseline Archaeological, Cultural and Palaeontological assessment and to conduct the required desktop and site verification.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.2 – Archaeological, Cultural, and Palaeontology**.

a. SUMMARY OF DESKTOP ASSESSMENT

**Heritage Resources**

Large sections of the study area used to be cultivated in the past and currently used for grazing and township development. The study area has been largely disturbed and the Department Forestry Fisheries and the Environment (DFFE) screening tool indicated the study area as of low heritage sensitivity with isolated areas of high heritage sensitivity (**Figure 11**). However, the verified sensitivity shows sites of significance (mostly cemeteries) and areas with high heritage potential and is illustrated in **Figure 12**. The sites on record for the proposed study area are mostly derived from Huffman and Van der Walt (2012) Heritage sites and areas of heritage potential are spatially illustrated in **Figure 12** and outlined in **Table 17**.

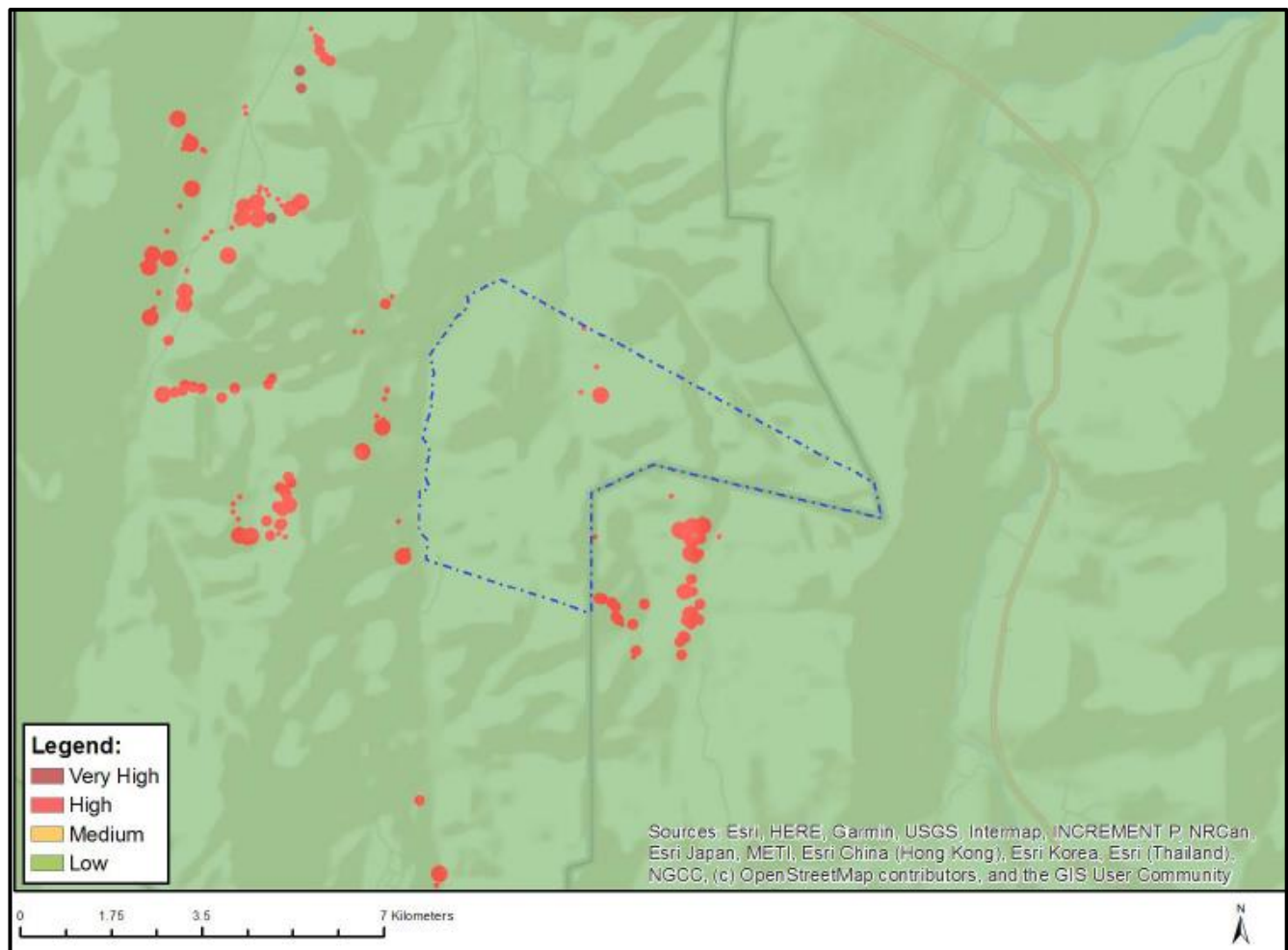


Figure 11: Sensitivity of the study area based on the DFFE screening tool. The study area is of low to high sensitivity.



Table 17: Known heritage sites in the study area

SITE NO.	SITE NAME	LOCATION	SITE DETAIL	SOURCE	SIGNIFICANCE
AA16	S1	25° 00' 46"S 30° 08' 57.8"E	Stone lines, maize grindstones and pottery marking household of African tenants	Huffman & Schoeman 2002	No Importance
AA17	S2	25° 00' 23.9"S 30° 08' 49.9"E	MIA Eiland or Leolo pottery and slag as well as Marateng pottery	Huffman & Schoeman 2002	Low Significance
AA18	Graves	25° 01' 02"S 30° 09' 00.4"E	Cemetery with three graves (-died 1979), one (E.M. Mankge-died 1967) with new headstone	Huffman & Schoeman 2002	High Social Significance
AA19	S4	25° 01' 00.2"S 30° 08' 48.2"E	Cleared area with stone lines marking household of African tenants	Huffman & Schoeman 2002	No Importance
AA87	Grave	25 00 46.1 30 06 41.8	1 grave	FR05 Stubbs	High Social Significance
AA88a	S2	25° 00' 21.5"S 30° 08' 28.8"E	Stone terraces, upper maize grindstone and sundried brick marking household of African tenants Stone terraces, upper maize grindstone and sundried brick marking household of African tenants	Huffman & Van der Walt 2012	Low Significance
AA88b	S2B	25° 00' 22.5"S 30° 08' 27.8"E	Stone terraces, upper maize grindstone and sundried brick marking household of African tenants Stone terraces, upper maize grindstone and sundried brick marking household of African tenants	Huffman & Van der Walt 2012	Low Significance
AA89	Graves	25° 00' 29.8"S 30° 08' 24.2"E	Cemetery with 5 graves, three with headstones (Mosehla-died 1980; J. Mosehla-died 1975; Methaka-died 1970)	Huffman & Van der Walt 2013	High Social Significance





AA90	S4	25° 00' 13.2"S 30° 08' 31.4"E	Single Single terrace line, lower maize grindstone, upper grindstones on boundary road marking household of African tenants	Huffman & Van der Walt 2012	Low Significance
AA91	S5	25° 01' 00.2"S 30° 08' 34.9"E	Rectangular house foundations, lower maize grindstone and midden marking household of African tenants.	Huffman & Van der Walt 2012	Low Significance
AA92	S7	25° 01' 06.7"S 30° 08' 53.7"E	Well-preserved household of African tenants with terrace lines, house remains, grindstones and midden. Leolo pottery underneath.	Huffman & Van der Walt 2012	High Significance
AA93	S8	25° 00' 38.4"S 30° 08' 38.6"E	MSA artefacts including triangular point, blade and scraper, all made from a black dolerite-like stone.	Huffman & Van der Walt 2012	Not Not in situ and therefore of no importance
AA94a	S9	25° 00' 20 - 21"S 30° 08' 46 - 47"	Stonewalled kraal, rectangular house foundation and lower grindstone marking household of African tenants. Leolo pottery eroding out of the road.	Huffman & Van der Walt 2012	Low Significance
AA95	S10	25° 00' 22.6"S 30° 08' 51.6"E	Scatter of small slag pieces in road upslope of Site AA94.	Huffman & Van der Walt 2012	Medium Significance
AA96	S11	25° 01' 44.9"S 30° 07' 42.2"E	Several stone lines marking household of African tenants	Huffman & Van der Walt 2012	No Importance
AA97	S12	25° 01' 51.6"S 30° 07' 44.9"E	Tenant household in good state of preservation with extant mud walls and front lapa wall	Huffman & Van der Walt 2012	High Significance
AA98	S13	25° 02' 04.9"S 30° 07' 26.5"E	Poor stone tool industry in quartz	Huffman & Van der Walt 2012	No Importance
AA99	S14	25° 01' 41.5"S 30° 07' 27.8"E	Tenants (No further description or significance rating)	Huffman & Van der Walt 2012	No rating
AA100	S15	25° 01' 38.3"S 30° 07' 35"E	Tenants (No further description or significance rating)	Huffman & Van der Walt 2012	No rating
AA101	S16	25° 01' 43"S 30° 07' 36.9"E	Tenants, Lgs, Pots	Huffman & Van der Walt 2012	No rating



AA102	S17	25° 02' 18.3"S 30° 07' 25.1"E	Walls and grindstones marking household of African tenants	Huffman & Van der Walt 2012	Low Significance
AA103	S18	25° 02' 20.3"S 30° 07' 25.1"E	Stone kraal and mud houses marking household of African tenants	Huffman & Van der Walt 2012	Medium Significance
AA104	Graves	25° 02' 24.9"S 30° 07' 27"E	Twelve graves associated with Petrus Mankge	Huffman & Van der Walt 2012	High Social Significance
AA105	Graves	25° 02' 11.9"S 30° 07' 19.9"E	8-9 graves	Huffman & Van der Walt 2012	High Social Significance
AA106	S20	25° 01' 24"S 30° 08' 27.8"E	Lapa wall, midden and house mounds marking household of tenants named Makolani	Huffman & Van der Walt 2012	Low Significance
AA107	S22	25° 00' 13.4"S 30° 07' 48.3"E	Tenants	Huffman & Van der Walt 2012	No Importance
AA107b	S22k	25° 00' 15.4"S 30° 07' 42.9"E	Kraal	Huffman & Van der Walt 2012	No Importance
AA108	S23	25° 01' 15.9"S 30° 08' 36"E	LIA Leolo pottery in old ploughed field next to Mareesburg house	Huffman & Van der Walt 2012	Low Significance
AA109	S24	25° 01' 15.9"S 30° 08' 36"E	MIA Eiland	Huffman & Van der Walt 2012	No Rating
AA115	S30	25 00 23.5 30 07 33.4	MIA Eiland	Huffman & Van der Walt 2012	No Rating
AA116	S31	25 00 26.9 30 07 30.6	Tenants (No further description or significance rating)	Huffman & Van der Walt 2012	No Rating

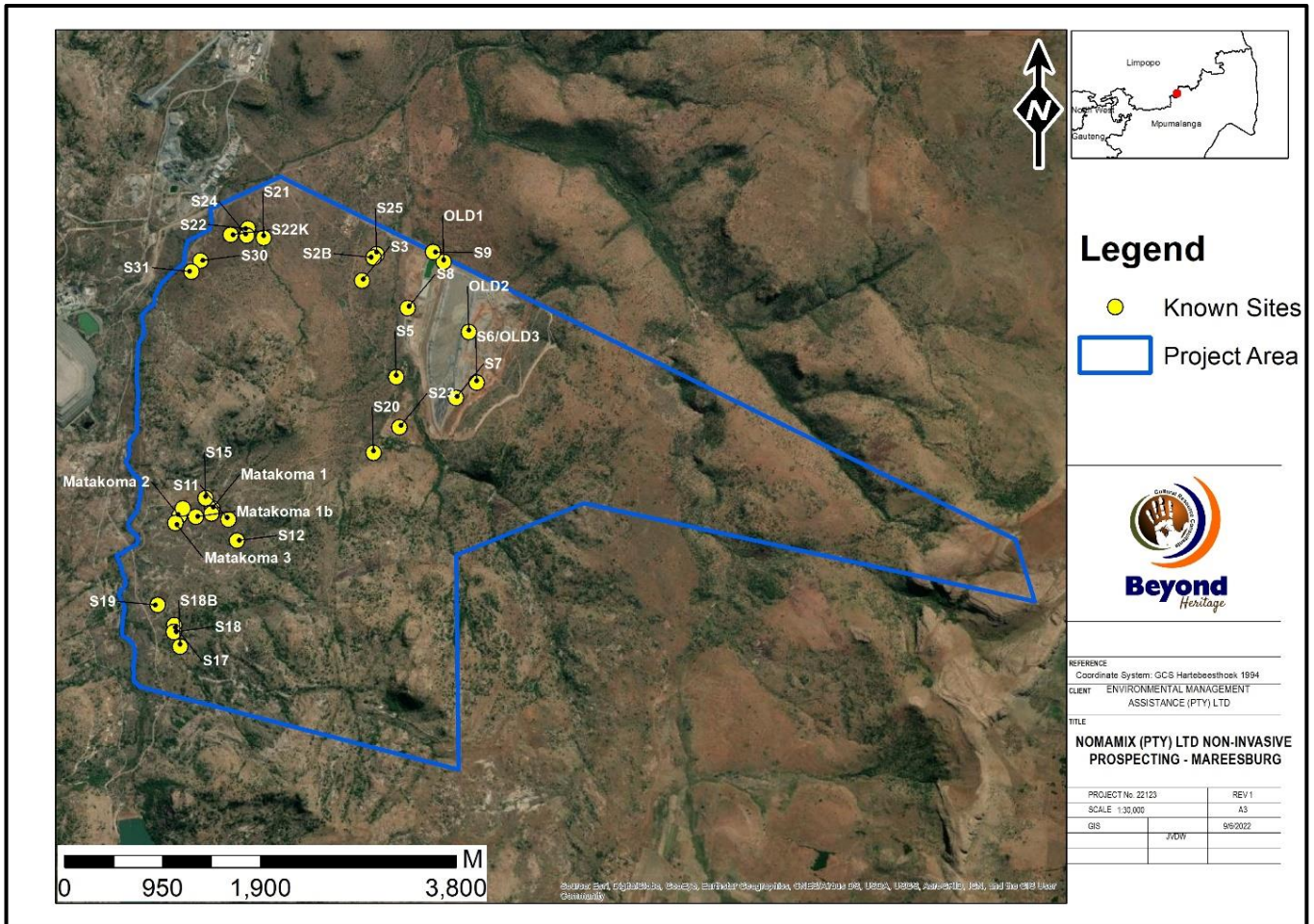


Figure 12: Known heritage sites and heritage sensitive areas in relation to the impact area

**Paleontological Heritage**

The DFFE Screening tool (**Figure 13**) indicated the study area to be of medium sensitivity, the study area is indicated to be of insignificant and low palaeontological sensitivity (**Figure 14**) on the SAHRIS paleontological map and no further studies are required for this aspect.

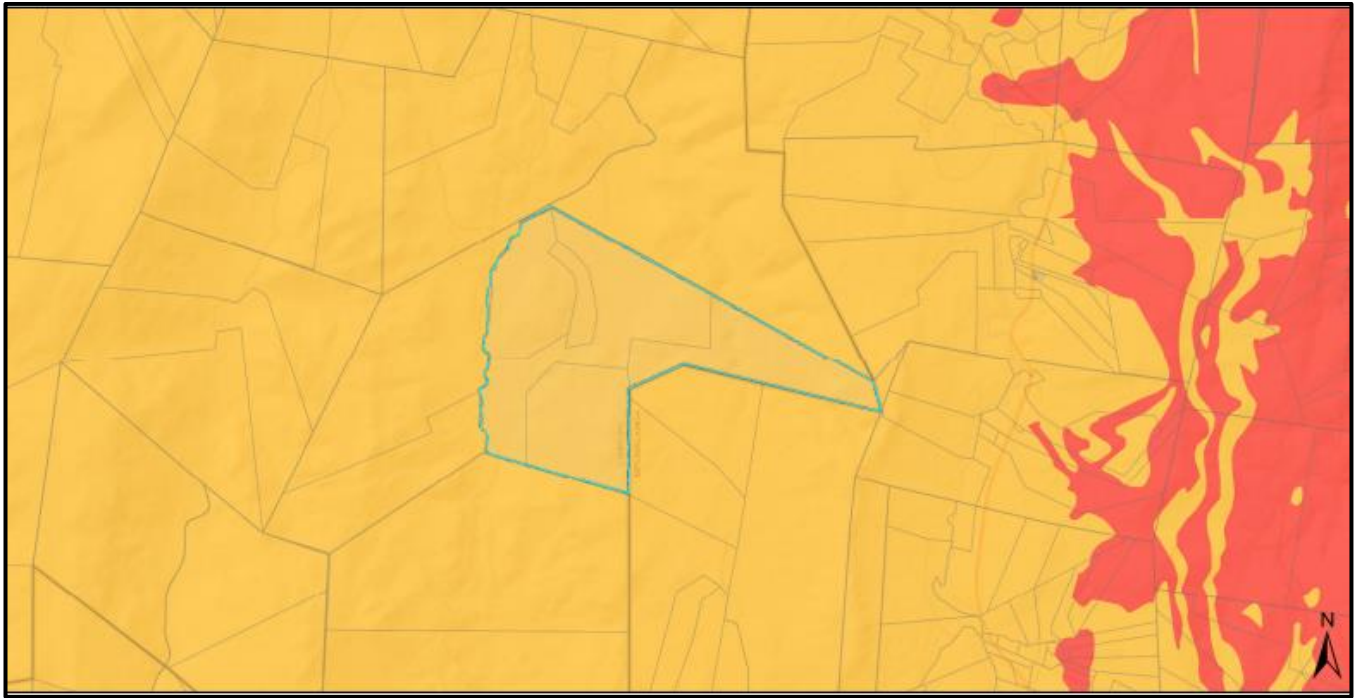
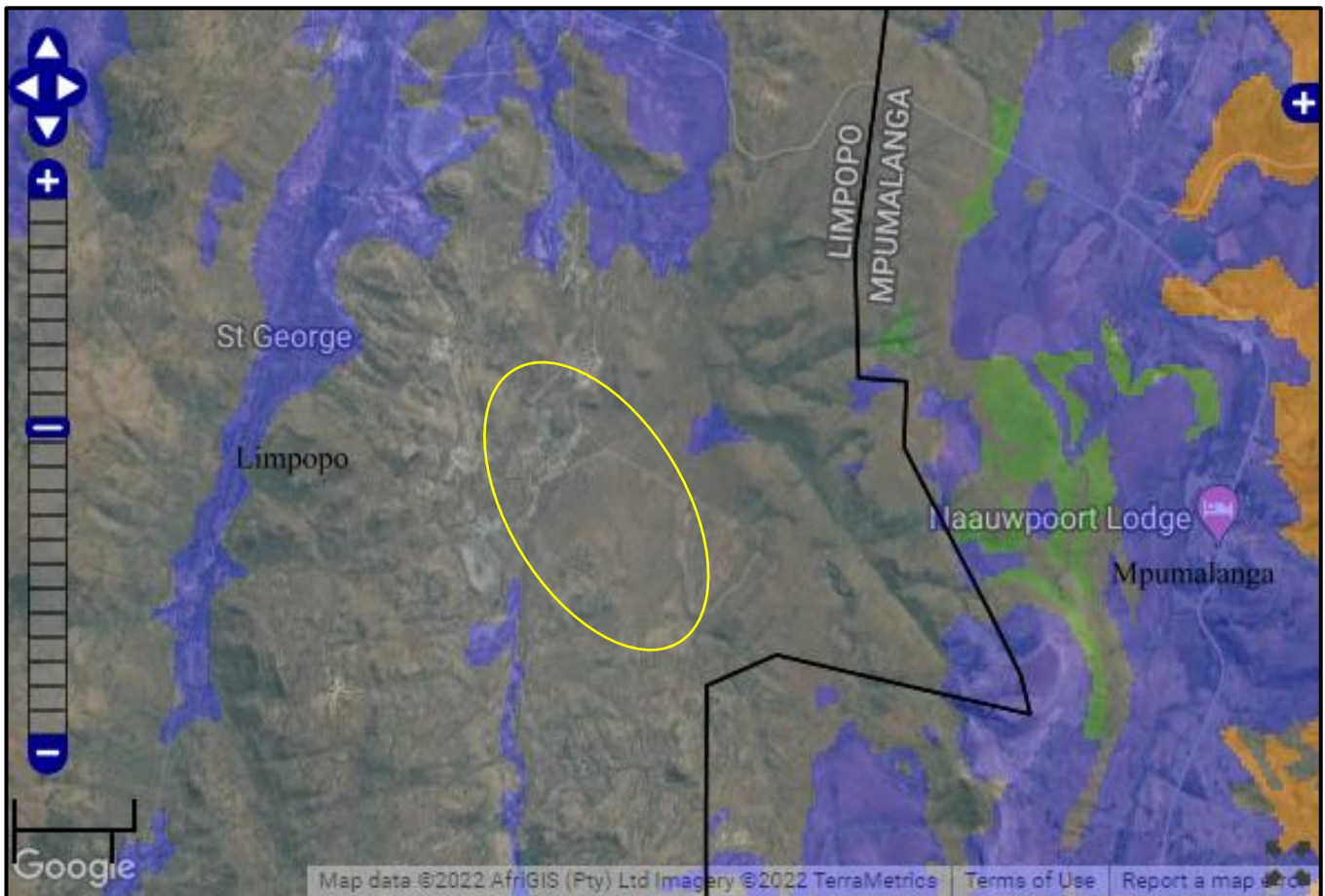


Figure 13: Palaeontological sensitivity as indicated on the DFFE Screening tool





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.

Figure 14: Palaeontological sensitivity map of the approximate study area (yellow polygon).

b. VERIFICATION OUTCOME

**Probability of occurrence of sites**

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. “**Low**” indicates that no known occurrences of sites have been found previously in the general study area. “**Medium**” probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area. A “**high**” probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability having sites.

**Table 18** summarises the sensitivity probability following the verification.

Table 18: Sensitivity probability

SENSITIVITY	PROBABILITY
PALAEONTOLOGICAL LANDSCAPE	
Fossil remains	<b>Low</b> Probability
ARCHAEOLOGICAL AND CULTURAL HERITAGE LANDSCAPE	
Early Stone Age (ESA)	<b>Low</b> Probability
Middle Stone Age (MSA)	<b>High</b> Probability
Late Stone Age (LSA)	<b>Medium</b> Probability
LSA –Herder	<b>Low</b> Probability
Early Iron Age (EIA)	<b>Medium</b> Probability
Middle Iron Age (MIA)	<b>High</b> Probability
Late Iron Age (LIA)	<b>High</b> Probability
Historical period	<b>Medium</b> Probability
Historical dumps	<b>Low to Medium</b> Probability
Structural remains	<b>Medium to High</b> Probability
Cultural Landscape	<b>Medium</b> Probability



For example, rainmaking sites	<b>Medium</b> Probability
Burials over 100 years	<b>High</b> Probability
Burials younger than 60 years	<b>High</b> Probability

### **Heritage resources**

Table 19: Known heritage sites in the study area

SITE NO.	SITE NAME	LOCATION	SITE DETAIL	SOURCE	SIGNIFICANCE
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AA88b	S2B	25° 00' 22.5"S 30° 08' 27.8"E	Stone terraces, upper maize grindstone and sundried brick marking household of African tenants Stone terraces, upper maize grindstone and sundried brick marking household of African tenants	Huffman & Van der Walt 2012	Low Significance



AA89	Graves	25° 00' 29.8"S 30° 08' 24.2"E	Cemetery with 5 graves, three with headstones (Mosehla-died 1980; J. Mosehla-died 1975; Methaka-died 1970)	Huffman & Van der Walt 2013	High Social Significance
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AA100	S15	25° 01' 38.3"S 30° 07' 35"E	Tenants (No further description or significance rating)	Huffman & Van der Walt 2012	No rating
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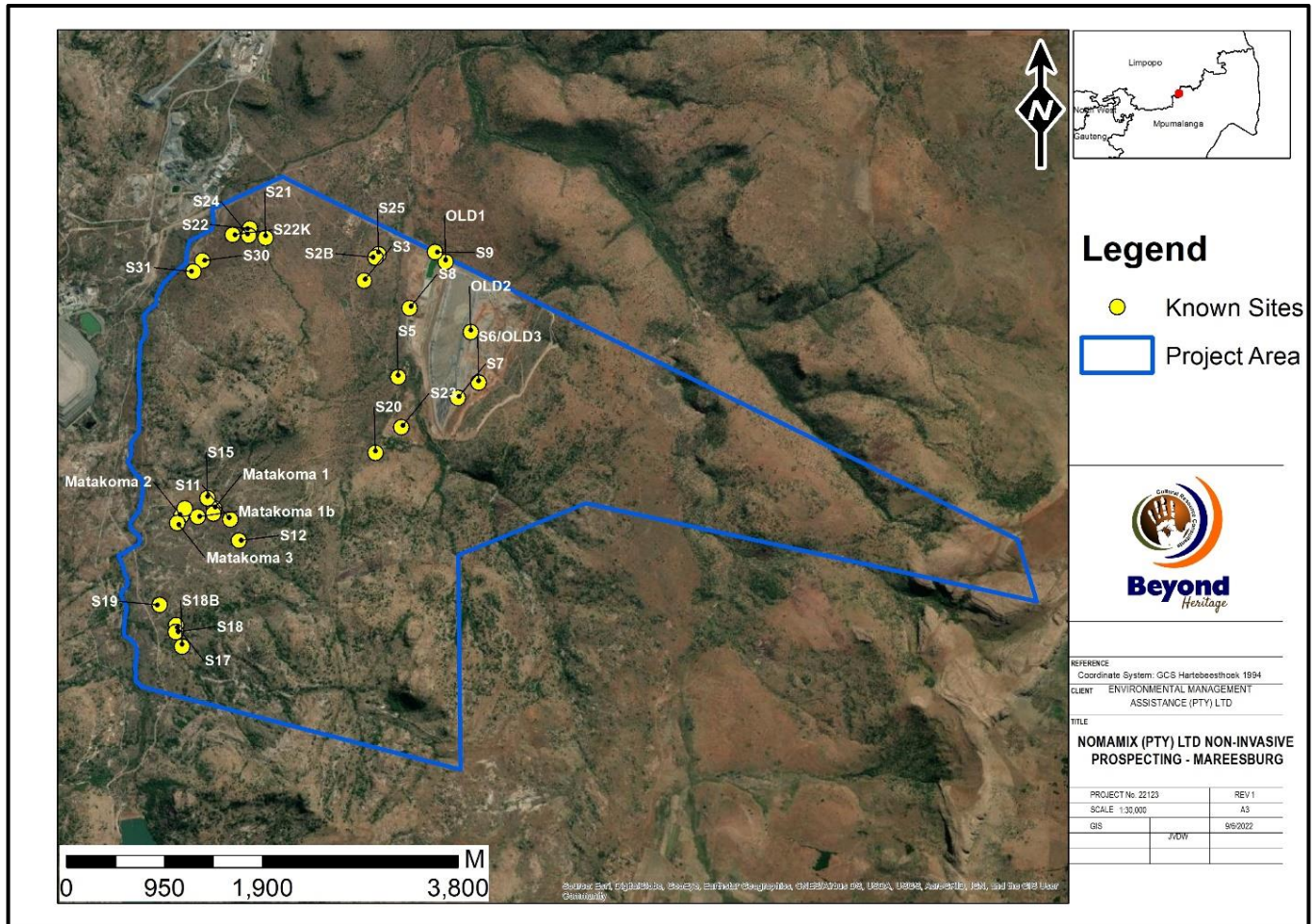


Figure 15: Known heritage sites and heritage sensitive areas in relation to the impact area

c. VERIFICATION STATEMENT

Table 20 provides the verification statement summary associated with Archaeological, Cultural and Paleontology baseline assessment.

Table 20: Verification statement summary

ASPECT	SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY
Palaeontology	Medium	Low	No further studies are required.
Cultural Heritage	Low to high	Medium to high	Prior to invasive activities the impact areas should be subjected to the heritage walkdown.

To comply with the National Heritage Resources Act (Act 25 of 1999) it is recommended that should invasive activities be required in future, impact areas should be subjected to a heritage walkdown prior to development as a condition of authorisation.

d. IMPACT STATEMENT



Based on the current information obtained for the area at a desktop level it is anticipated that any heritage resources that occur within the proposed development area will have a Local Significance (LS), Grade 3B or lower field rating and all sites should be mitigatable. Graves are of high social significance (Field rating GP A) and can be expected anywhere on the landscape.

The scoping study did not identify any fatal flaws for the proposed Mareesburg Prospecting Project. No impact is expected on heritage resources or the cultural landscape as prospecting will be non-invasive. The study area is of insignificant paleontological sensitivity and according to the SAHRIS palaeontological sensitivity map no further studies are required for this aspect.

**Table 21** provides a summary of the expected impacts related to the non-invasive prospecting activities.

Table 21: Expected impact on heritage resource

<b>Impact on Heritage resources</b>			
No impact is expected on heritage resources as prospecting will be non-invasive and consist of data search, field mapping and desktop studies, logging and sampling historical core; and scoping and (pre) feasibility studies.			
<b>ISSUE</b>	<b>NATURE OF IMPACT</b>	<b>EXTENT OF IMPACT</b>	<b>NO-GO AREAS</b>
No direct or indirect impacts are expected on heritage resources through non intrusive prospecting.	Not Applicable	No impact expected	Where graves occur
<b>Description of expected significance of impact</b>			
Not applicable			
<b>Gaps in knowledge &amp; recommendations for further study</b>			
It is recommended that if invasive activities are required the impact areas should be subjected to a heritage walkdown down to comply with Section 38 (8) of the National Heritage Resources Act.			

e. REASONED OPINION FOR ISSUING THE EA

Based on the current information obtained for the area at a desktop level no red flags were identified, and non-invasive prospecting will not negatively affect the cultural resources of the area.

#### IV. TERRESTRIAL BIODIVERSITY

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed by Environmental Management Assistance (Pty) Ltd on behalf of Nomamix (Pty) Ltd to conduct a baseline Terrestrial Biodiversity assessment and to conduct the required desktop and site verification.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.3 - Terrestrial Assessment**.



a. SUMMARY OF DESKTOP ASSESSMENT

The following section contains data accessed as part of the desktop assessment and are presented as a “dashboard” report below (**Table 22** and **Table 23**). The dashboard report aims to present concise summaries of the data on as few pages as possible to allow for improved assimilation of results by the reader to take place. Where required, further discussion and interpretation are provided.



Table 22: Database summaries of the vegetation characteristics associated with the application area (Quarter Degree Squares (QDS) 2530 AA)

DESCRIPTION OF THE VEGETATION TYPE(S) RELEVANT TO THE APPLICATION AREA ACCORDING TO THE 2018 FINAL VEGETATION MAP OF SOUTH AFRICA, LESOTHO, AND SWAZILAND (SANBI 2006–2018 & SANBI, 2018A)					
<b>BIOMES AND BIOREGIONS</b> <i>Figure 16</i>	Most of the application area is in the <b>Savanna Biome (and Central Bushveld Bioregion)</b> . Small sections in the east and south, however, occur in the <b>Grassland Biome (and Mesic Highveld Grassland Bioregion)</b> .				
DESCRIPTION OF THE VEGETATION TYPES ASSOCIATED WITH THE APPLICATION AREA ACCORDING TO MUCINA & RUTHERFORD (2006) - ORIGINAL EXTENT OF VEGETATION TYPES ( <i>Figure 17</i> )					
The application area occurs in three vegetation types. The remaining extent of these vegetation types are mapped in Figure 4 (based on the 2018 NBA database). The below section includes description of the vegetation types as per Mucina and Rutherford (2006). The updated conservation status is provided in the section discussing the NBA (2018) database.					
SEKHUKHUNE MOUNTAIN BUSHVELD (SVCB 28)					
<b>DISTRIBUTION</b>	Limpopo and Mpumalanga Provinces.				
<b>CLIMATE</b>	Summer rainfall with very dry winters.				
	<b>MAP (mm)</b>	<b>MAT (°C)</b>	<b>MFD (days)</b>	<b>MAPE (mm)</b>	<b>MASMS (%)</b>
	609	17.5	5	2043	77
<b>ALTITUDE (M)</b>	900–1 600 m				
<b>GEOLOGY &amp; SOILS<sup>3</sup></b>	Rocks mainly ultramafic intrusive of the lower, critical and main zones of the eastern Rustenberg Layered Suite of the Bushveld Igneous Complex (Vaalian). Three subsuites (zones), namely Croydon, Dwars River and Dsjate consist mainly of norite, pyroxenite, anorthosite and gabbro, and are characterised by localised intrusions of magnetite, diorite, dunite, bronzitite and harzburgite. Soils are predominantly shallow, rocky and clayey. Glenrosa and Mispah soil forms are common, with lime present in low-lying areas. Rocky areas without soil are common on steep slopes. The Dwars River Valley is characterised by prismacutanic horizons with melanic structured diagnostic horizons. Around Steelpoort red apedal, freely drained soils occur, and these deeper soils include Hutton, Bonheim and Steendal soil forms.				
<b>CONSERVATION</b>	Least threatened. Target 24%. None conserved in statutory conservation areas.				
<b>VEGETATION &amp; LANDSCAPE FEATURES</b>	Dry, open to closed microphyllous <sup>4</sup> and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the north-eastern escarpment. Open bushveld often associated with ultramafic soils on southern aspects. Bushveld on ultramafic soils contain a high diversity of edaphic specialists. Bushveld of mountain slopes generally taller than in the valleys, with a well-developed herb layer. Bushveld of valleys and dry northern aspects usually dense, like thicket, with an herb layer comprising many short-lived perennials. Dry habitats contain several species with xerophytic adaptations, such as succulence and underground storage organs. Both man-made and natural erosion dongas occur on foot slopes of clays rich in heavy metals.				
SEKHUKHUNE MONTANE GRASSLAND (GM 19)					

<sup>3</sup> Land types refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Ea refers to dark, blocky clay topsoil (often swelling clays) and/or red, structured clays. Land type categories are as follows: Bb = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic; Ba = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic but with < 10 % clay soils (ARC: Land Type Survey Staff. 1972 – 2006).

<sup>4</sup> Microphyllus - having very small leaves. From micro meaning small and phyllous referring to leaves.



<b>DISTRIBUTION</b>	Continuous undulating norite hills in the Roossenekal region, from Stoffberg in the south, northwards through Mapochs Gronde to Schurinksberg in the north, with the Steelpoort River in the west.				
<b>CLIMATE</b>	This unit experiences a similar climate to the adjacent Lydenburg Montane Grassland, although frost incidence decreases towards the north. Summer-rainfall regime with the MAP from about 720 mm in the east to 600 mm in the west, much of the rain falling in the form of thunderstorms in summer from November to January.				
	<b>MAP (mm)</b>	<b>MAT (°C)</b>	<b>MFD (days)</b>	<b>MAPE (mm)</b>	<b>MASMS (%)</b>
	688	15.3	17	1983	75
<b>ALTITUDE (M)</b>	1 300 – 1 960 m				
<b>GEOLOGY &amp; SOILS<sup>5</sup></b>	The area mostly overlies the mafic intrusive rocks of the Upper and Main Zones of the Rustenburg Layered Suite, which is economically the most important part of the Bushveld Igneous Complex (Vaalian Erathem). The west of this area is dominated by diorite and gabbro (often magnetite-rich) of the Roossenekal Subsuite, whereas the east is dominated by gabbro and norite of the Dsjate Subsuite. In the extreme northeast of the area are metasediments of the Pretoria Group (also Vaalian Erathem) that were metamorphosed by the intrusion of the Bushveld Igneous Complex. Substrates of the undulating hills are generally heterogeneous rocky areas with miscellaneous soil types and those of the southern plains have diagnostic horizons that are vertic, melanic or red-structured. Dominant soil forms have a high clay content and include Arcadia, Mayo, Milkwood, Mispah, Shortlands and Steendal. Ea land type covers 40% of the area, with minor occurrences of Ib and Ab.				
<b>CONSERVATION</b>	<p><b>Vulnerable (VU)</b> according to Mucina and Rutherford (2006) but the status has been changed to <b>Least Concern (LC)</b> according to the updated VegMAP project (SANBI 2006-2018).</p> <p>Conservation target 24%. Approximately 30% of this area is under commercial or subsistence cultivation. Vast areas are mined for vanadium using strip mining, and in recent years mining of gabbro has increased substantially (Siebert et al. 2002c). There is no formal conservation in the region, although many farmers have embarked on ecotourism initiatives. Erosion very low (56%), moderate (18%) and high (16%).</p>				
<b>VEGETATION &amp; LANDSCAPE FEATURES</b>	Major chains of hills transect the area and have a north-south orientation, creating moderately steep slopes with predominantly eastern and western aspects. Large norite boulders and stones cover the shallow soils on the hillsides. Dense, sour grassland occur on slopes of mountains and undulating hills, with scattered clumps of trees and shrubs in sheltered habitats. Turf and clay soils characterise the open plains between the chains of hills and culminate in an open plain in the Stoffberg area. Dense, tall grassland is found on the plains and encroachment by indigenous or invasion by alien microphyllous tree species is common in places.				
<b>STEENKAMPSBERG MONTANE GRASSLAND (GM 30)</b>					
<b>DISTRIBUTION</b>	Occurring along the Steenkampsberg escarpment that extends from the headwaters of the Waterval River in mountains north-west of Lydenburg, extending southwards through Dullstroom towards Belfast, then eastwards through Machadodorp to Bambi and Elandshoogte				
<b>CLIMATE</b>	Climate is a seasonally arid temperate region with hot summers and cool and dry winters.				
	<b>MAP (mm)</b>	<b>MAT (°C)</b>	<b>MFD (days)</b>	<b>MAPE (mm)</b>	<b>MASMS (%)</b>
	789	14.1	23	1835	23
<b>ALTITUDE (M)</b>	2330 m (highest point)				

<sup>5</sup> Land types refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Ea refers to dark, blocky clay topsoil (often swelling clays) and/or red, structured clays. Land type categories are as follows: Bb = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic; Ba = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic but with < 10 % clay soils (ARC: Land Type Survey Staff. 1972 – 2006).



<p><b>GEOLOGY &amp; SOILS<sup>6</sup></b></p>	<p>The geology broadly forms part of the Pretoria Group, with the Dullstroom, Steenkampsberg, Lakenvlei, Vermont, Magaliesberg, Silverton, Strubenkop, Daspoort, Hekpoort, and Timeball Hill Formations running from the west through to the east. The Pretoria Group is commonly intersected by the intrusive Transvaal Diabase in the form of dykes and sills. The resulting rocks are predominantly comprised of quartzite, shale, dolerite, diabase and basalt.</p> <p>Soils are shallow to deep, well-drained; either dystrophic and/or mesotrophic depending on geology. Soil derived from quartzite results in sandy, white dystrophic soils with high humus content.</p>
<p><b>CONSERVATION</b></p>	<p>Much of this unit is still natural (74.7%) although some parts have been afforested (14%) or cultivated (4%) with crops such as maize and to a lesser extent peach orchards. As much as 6% of this is comprised of old abandoned cultivated lands. Mining is a threat (0.25%) as this unit overlies considerable mineral wealth. This unit is poorly protected as only 12.4% of its national target of 27% is formally protected.</p>
<p><b>VEGETATION &amp; LANDSCAPE FEATURES</b></p>	<p>The landscape is mountainous with plateau grasslands, mountain slopes and shallow valleys. Grasslands are short with high forb diversity. The highest point in Mpumalanga (2330 m) occurs just north of the Steenkampsberg Pass.</p> <p><b>Remarks</b> A floristic analysis of the vegetation along the Mpumalanga escarpment supports the recognition of a new centre of plant endemism (Lydenburg Centre) with the proposal of two subcentres of plant endemism, namely the Long Tom Pass Subcentre and the Steenkampsberg subcentre. The Steenkampsberg subcentre has at least 15 endemic taxa.</p>
<p><b>DESCRIPTION OF THE VEGETATION TYPES ASSOCIATED WITH THE APPLICATION AREA IN TERMS OF THE NATIONAL BIODIVERSITY ASSESSMENT (NBA) 2018 DATASET - REMAINING EXTENT OF VEGETATION TYPES (Figure 17)</b></p>	
<p><b>NATIONAL BIODIVERSITY ASSESSMENT (NBA) (2018)</b></p> <p><b>FIGURE 6</b></p>	<p>As mentioned previously, three vegetation types are associated with the application area. The NBA database indicates that the associated vegetation types are largely still intact, with only small sections transformed. Most of the application area is associated with the Sekhukhune Mountain Bushveld which is listed as <b>LC</b> and is currently <b>Poorly Protected (PP)</b>. The rest of the application area (eastern section thereof) is associated with two montane grassland vegetation types, namely the Sekhukhune Montane Grassland, currently listed as <b>LC</b> but is <b>Not Protected (NP)</b>, and the Steenkampsberg Montane Grassland listed as <b>LC</b>, and which is currently <b>PP</b>.</p> <p>The NBA is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. Two headline indicators that are applied to both ecosystems and species are used in the NBA: threat status and protection level:</p> <ol style="list-style-type: none"> <li>i. Ecosystem threat status tells us about the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function, and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), VU or LC, based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds.</li> <li>ii. Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected, Poorly Protected, Moderately Protected or Well Protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA).</li> </ol>

<sup>6</sup> Land types refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Ea refers to dark, blocky clay topsoil (often swelling clays) and/or red, structured clays. Land type categories are as follows: Bb = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic; Ba = Non-red (Hu, Bv <33%); dystrophic/mesotrophic > eutrophic but with < 10 % clay soils (ARC: Land Type Survey Staff. 1972 – 2006).

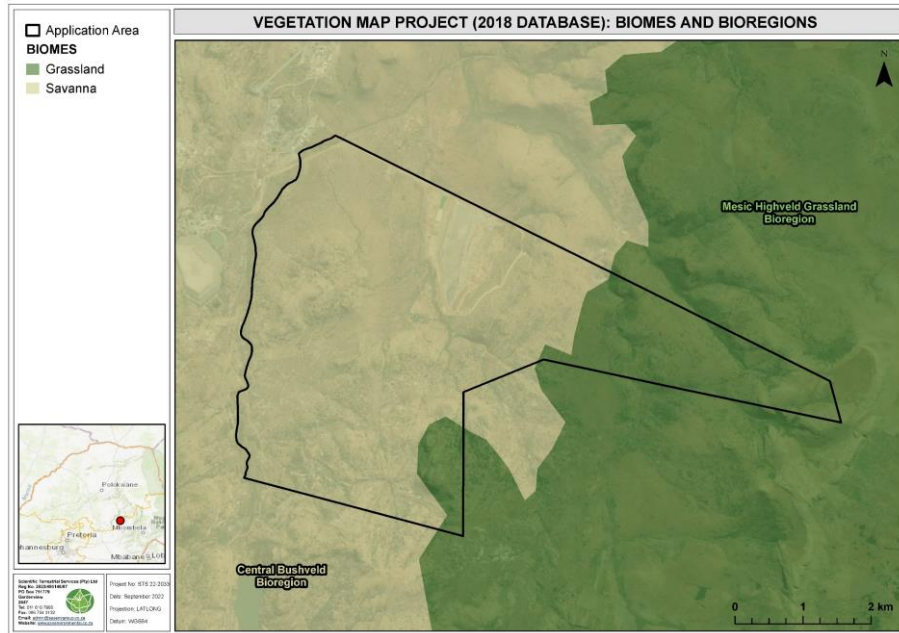


Figure 16: Biomes and bioregions associated with the application area (SANBI, 2018a)

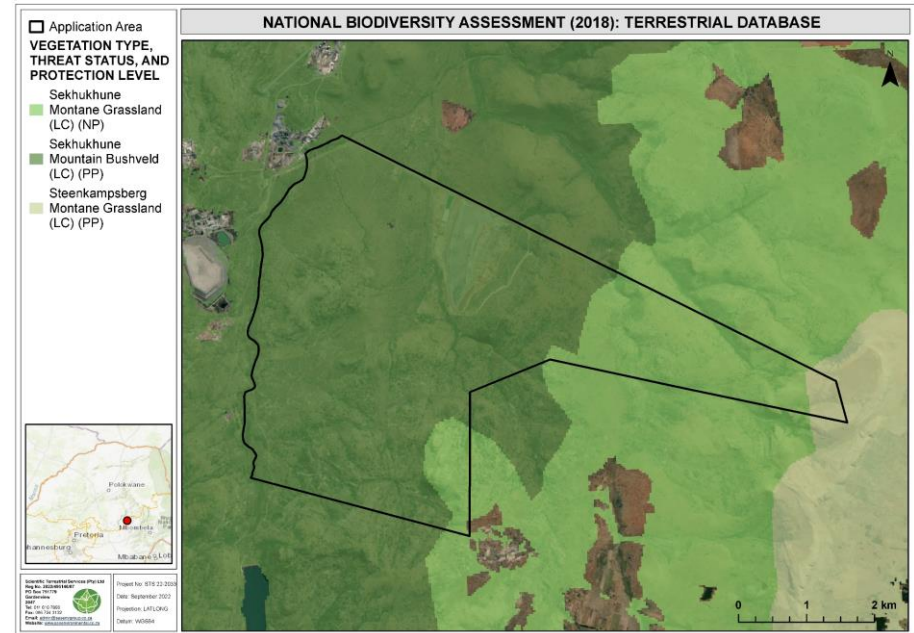


Figure 17: Remaining extent of the vegetation types, including threat status and protection level (SANBI, 2018b-c)

Table 23: Database summaries of the biodiversity and conservation characteristics associated with the application area (QDS 2530AA)

LIMPOPO CONSERVATION PLAN (2018) – FIGURE 5	
The application area is associated with one CBA category according to the updated 2018 Limpopo Province Map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).	
<b>CBA 2</b>	<p>The entire application area (apart from a very small section in the north-western corner) occurs in a <b>CBA 2</b>, which are areas considered “<b>optimal</b>” best design selected sites, areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets.</p> <p><b>Land Management Recommendations:</b> Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes. <b>Incompatible Land-Use:</b> Urban land-uses including Residential (golf estates, rural residential, resorts), Business, mining &amp; Industrial, Infrastructure (roads, power lines, pipelines). More intensive agricultural production than currently undertaken on site. Note: Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to CBA 2. Alternative areas may need to be identified to ensure the CBA network still meets the required targets.</p>



**CONSERVATION DETAILS PERTAINING TO THE APPLICATION AREA (VARIOUS DATABASES)**

<p><b>NATIONAL THREATENED ECOSYSTEMS (2011) (FIGURE 6)</b></p>	<p>The application area is within the remaining extent of the EN <b>Sekhukhune Mountainlands Ecosystem</b>. This ecosystem is listed in GN 1002<sup>7</sup> under Criterion F: Priority areas for meeting explicit biodiversity targets as defined by a systematic biodiversity plan.</p> <p><b>Key biodiversity features include:</b></p> <ul style="list-style-type: none"> <li>- <u>Two mammal species</u>: Juliana's Golden Mole and Gunning's Golden Mole;</li> <li>- <u>Eight bird species</u> including Blue Crane, Blue Korhaan and Cape Vulture, Grey Crowned Crane, Rudd's Lark, Southern Ground Hornbill, Wattled Crane, Yellowbreasted Pipit;</li> <li>- <u>Nineteen plant species</u> for example <i>Aloe fouriei</i>, <i>Gladiolus rufomarginatus</i>, <i>Lydenburgia cassinioides</i>, <i>Resnova megaphylla</i> (= <i>Ledebouria megaphylla</i>), <i>Scilla natalensis</i> (= <i>Merwillia plumbea</i>), and VU Sensitive species; and</li> </ul>	<p><b>IBA (2015)</b></p>	<p>The application area does not occur in an IBA, nor are there any IBAs within 10 km thereof.</p>
		<p><b>SAPAD AND SACAD (2022); NPAES (2018)</b></p>	<p>According to the SAPAD (2022)<sup>8</sup> and SACAD (2022)<sup>9</sup>, no formal or informal protected areas or conservation areas occur within 10 km of the application area.</p> <p>Most of the application area is, however, in the Sekhukhune Centre of Plant Endemism (SCPE), with the far eastern corner in the Lydenburg Centre of Plant Endemism (LCPE) (van Wyk <i>et al.</i>, 2002) (Figure 7).</p> <p>The NPAES (2018) indicates that the application area is in Priority Focus Areas (Figures 8). For Limpopo, the Priority Focus Areas include various biodiversity features to target potential protected area expansion.</p>

<sup>7</sup> Government Notice (GN) 1002 National Environmental Management: Biodiversity Act (10/2004): National list of ecosystems that are threatened and in need of protection. Gazette 34809, 9 December 2011.

<sup>8</sup> **SAPAD (2022)**: The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the "System of Protected Areas", which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

<sup>9</sup> **SACAD (2022)**: The types of conservation areas that are currently included in the database are the following: 1. Biosphere reserves, 2. Ramsar sites, 3. Stewardship agreements (other than nature reserves and protected environments), 4. Botanical gardens, 5. Transfrontier conservation areas, 6. Transfrontier parks, 7. Military conservation areas and 8. Conservancies.





	<ul style="list-style-type: none"> <li>- <u>Five vegetation types</u> including Sekhukhune Montane Grassland, Sekhukhune Mountain Bushveld, Steenkampsberg Montane Grassland, Lydenburg Thornveld and Ohrigstad Mountain Bushveld.</li> </ul> <p>The ecosystem forms part of the Sekhukhuneland Centre of Endemism; it includes important sub-catchments, pans and wetlands and is important for grassland processes.</p> <p><b>Note:</b> <i>The National List of Threatened Terrestrial Ecosystems published in terms of the NEMBA in 2011 remains in legal force. The data contained in NBA 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.</i></p>	<p><b>STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)</b></p>	<p>No Strategic Water Source Areas (SWSA) are associated with the application area, nor were any identified within 10 km thereof.</p> <p>Surface water SWSAs are defined as areas of land that supply a disproportionate (i.e., relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.</p>
<p><b>MINING AND BIODIVERSITY GUIDELINES (2012)</b></p>			
<p><b>HIGHEST BIODIVERSITY IMPORTANCE</b></p>	<p>The entire application area is in an area of <b>Highest Biodiversity Importance</b>. These areas are regarded to pose the Highest risk for mining.</p> <p><b>Implications for mining:</b> Environmental screening, EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision making for mining, water use licences, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features.</p>		
<p><b>NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS (NFEPA) – 2011 DATABASE</b></p>			
<p><b>WETLAND VEGETATION TYPE</b> <b>FIGURE 9</b></p>	<p>The application area occurs in three wetland vegetation types, namely the CR Central Bushveld Group 1 (most of the central and western sections), the LC Mesic Highveld Grassland Group 6 (far eastern extent), and the EN Mesic Highveld Grassland Group 7 (within the eastern extent).</p> <p>The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. Wetland vegetation groups are based on groupings of national vegetation types expected to share similar types of wetlands. They were used in combination with the landform map to identify wetland ecosystem types.</p>		

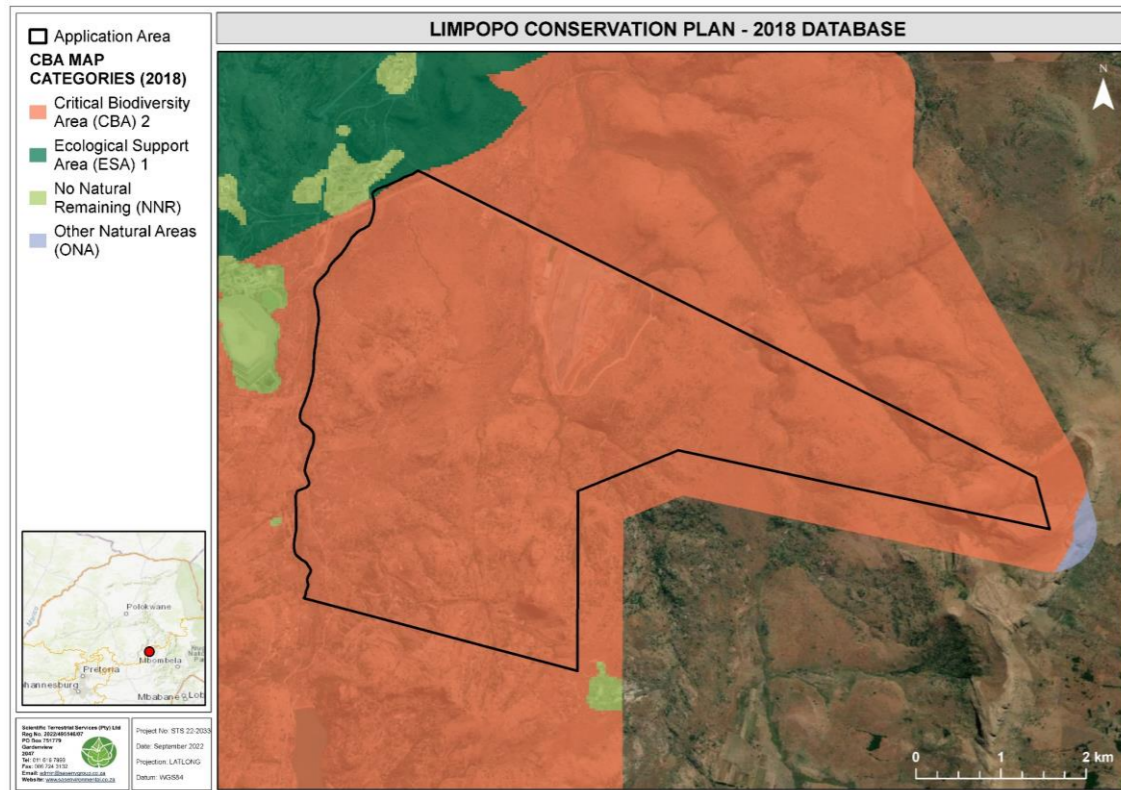


Figure 18: The application area in relation to the Limpopo Conservation Plan (2018)

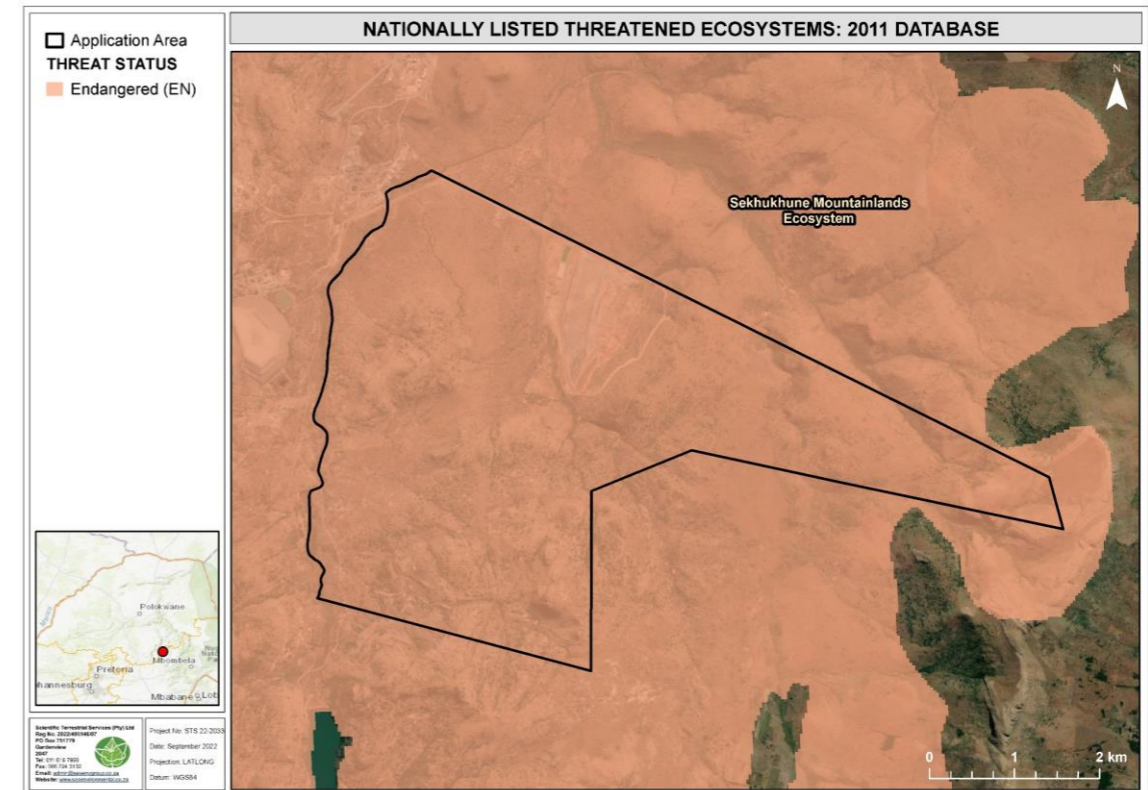


Figure 19: Endangered ecosystems associated with the application area (National Threatened Ecosystems database of 2011)

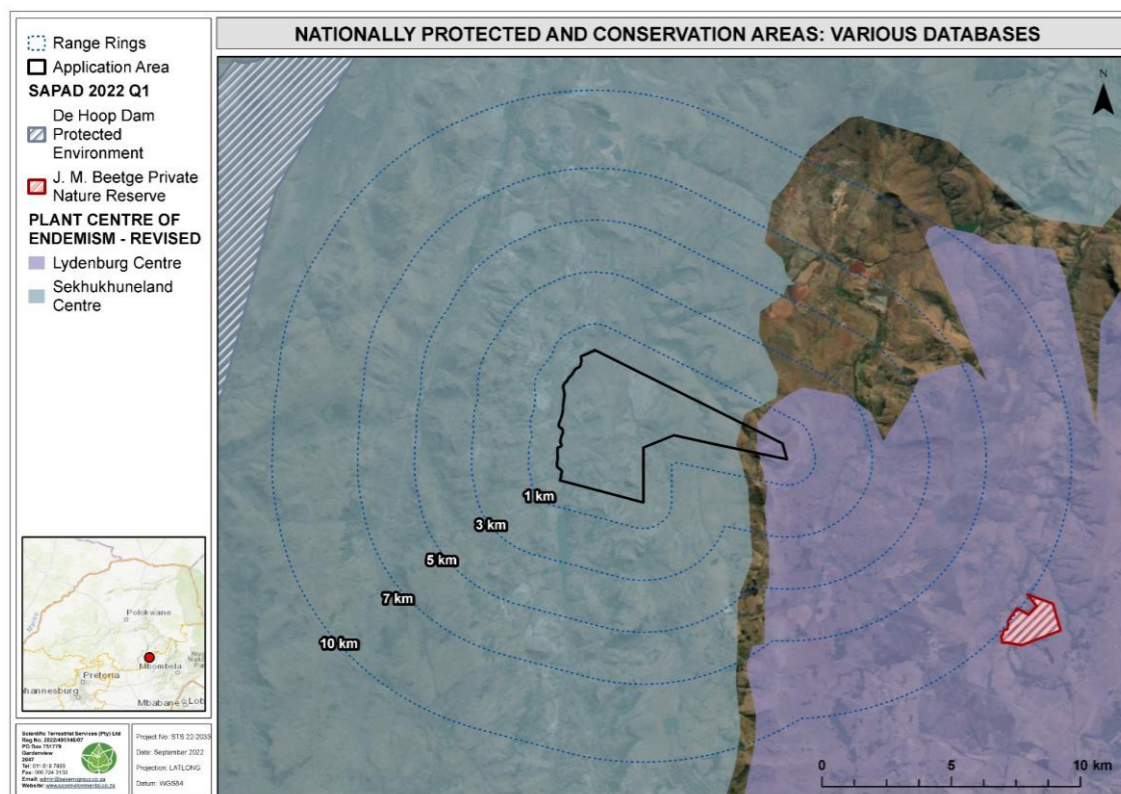


Figure 20: The application area in relation to protected areas (as per SAPAD, 2022 Q1) and Centers of Plant (or phyto) Endemism (CPE)

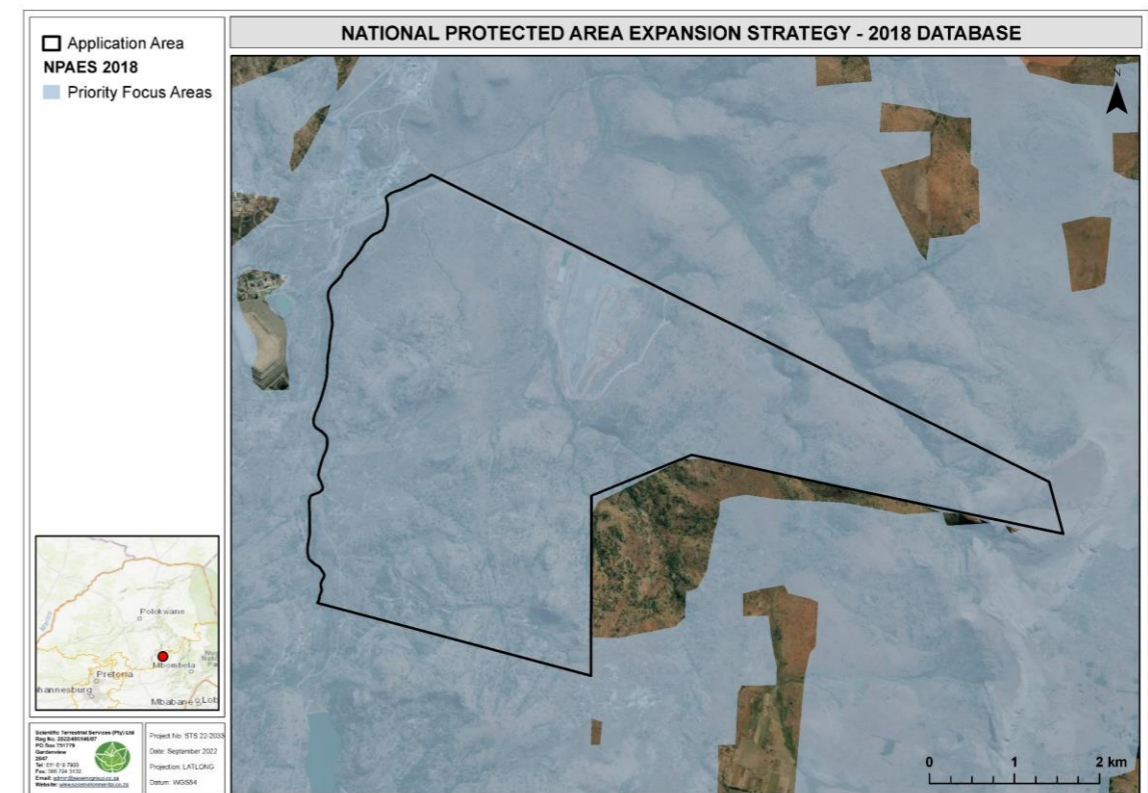


Figure 21: Priority Focus Areas in relation to the application area (NPAES, 2018)

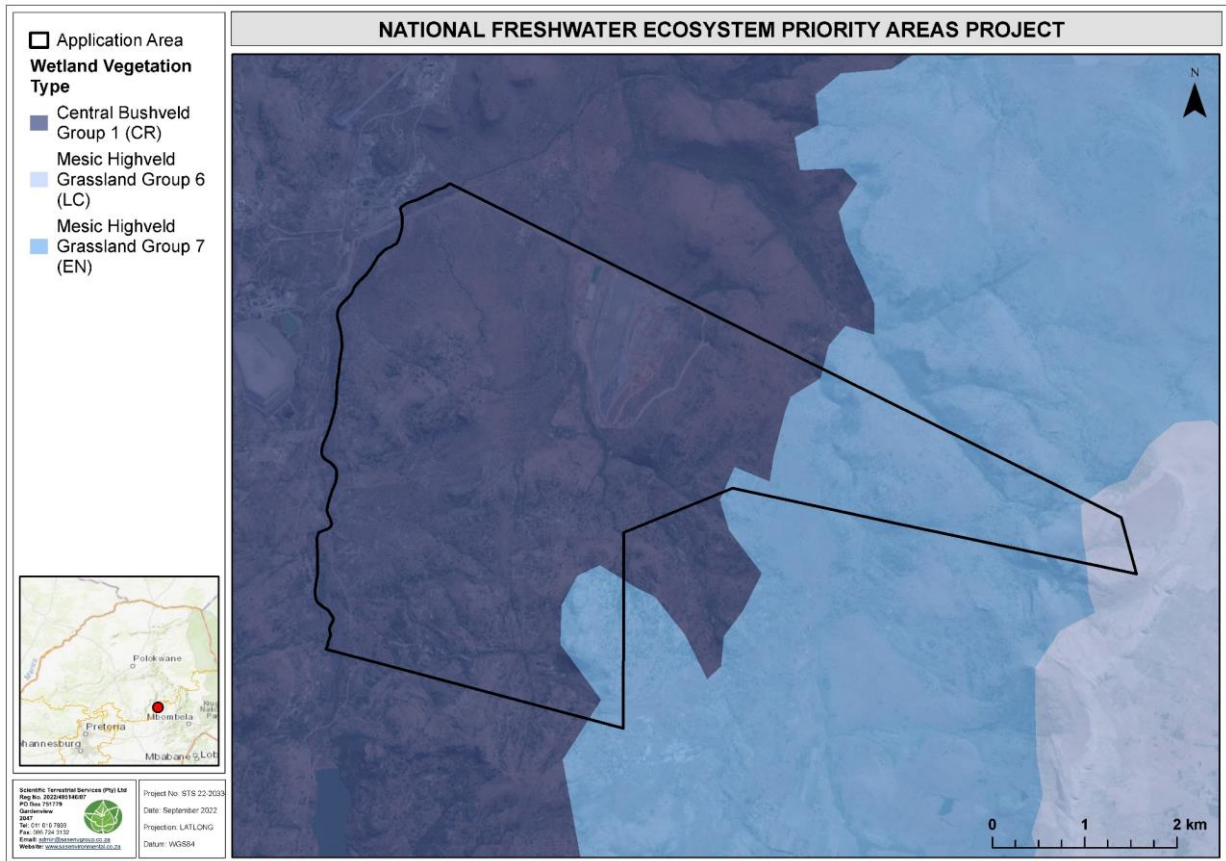


Figure 22: The application area in relation to the various wetland vegetation types (as per the NFEPA 2011 database)



a. VERIFICATION OUTCOME

**Table 24** provides the summary of the Screening Report outcome associated with the proposed non-invasive prospecting right area.

Table 24: Summary of the Screening Report outcome for the application area

NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL	
<p>The Screening Tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the Environmental Authorisation (EA) process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below:</p> <ul style="list-style-type: none"> <li>➤ <b>Very High:</b> Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km<sup>2</sup> are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under CR, EN, or VU<sup>10</sup> D criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa's National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.</li> <li>➤ <b>High:</b> Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level.</li> <li>➤ <b>Medium:</b> Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level.</li> <li>➤ <b>Low:</b> Areas where no species of conservation concern (SCC) are known or expected to occur.</li> </ul> <p><b>**As per the best practise guidelines as stipulated by the South African National Biodiversity Institute (SANBI, i.e., the regulatory body for biodiversity within South Africa) protocol, the name of these sensitive species must remain confidential and should not be shared outside of the current report, especially into public domain.</b></p>	
<p><b>ANIMAL SPECIES THEME FIGURE (Figure 23)</b></p>	<p>For the animal species theme, the application area is considered to largely be in an area of <b>medium sensitivity</b>, with a scattered sections considered to be of <b>high sensitivity</b>. The triggered species are provided below.</p> <p>High Sensitivity triggering species:</p> <ul style="list-style-type: none"> <li>- <u>Class Avifauna:</u> <i>Falco biarmicus</i> (Lanner Falcon; VU), and <i>Polemaetus bellicosus</i> (Martial Eagle; EN).</li> <li>- <u>Class Mammalia:</u> <i>Rhinolophus cohenae</i> (Cohen's Horseshoe Bat; VU).</li> </ul> <p>Medium Sensitivity triggering species:</p> <ul style="list-style-type: none"> <li>- <u>Class Avifauna:</u> <i>Podica senegalensis</i> (African Finfoot; VU), <i>Stephanoaetus coronatus</i> (Crowned Eagle; VU), <i>Hydroprogne caspia</i> (Caspian Tern; VU), <i>Neotis denhami</i> (Denham's Bustard; VU), <i>Geronticus calvus</i> (Southern Bald Ibis; VU), <i>Aquila rapax</i> (Tawny Eagle; EN), <i>Aquila verreauxii</i> (Verreaux's Eagle; VU), <i>Eupodotis senegalensis</i> (White-bellied Korhaan; VU).</li> <li>- <u>Class Mammalia:</u> <i>Amblysomus robustus</i> (Robust Golden Mole; VU), <i>Chrysospalax villosus</i> (Rough-haired Golden Mole; VU), <i>Crociodura maquassiensis</i> (Makwassie musk Shrew; VU), <i>Dasymys robertsii</i> (African Marsh Rat; VU), <i>Hydrictis maculicollis</i> (Spotted-necked Otter; VU), <i>Lycaon pictus</i> (African Wild Dog; EN), <i>Ourebia ourebi ourebi</i> (Oribi; EN).</li> </ul>

<sup>10</sup> In the Vulnerable category, the D criteria encompass species with less than 1 000 individuals, or area of occurrence of less than 20 km<sup>2</sup>.



	<ul style="list-style-type: none"> <li>- <u>Class Reptilia</u>: <i>Kinixys lobatsiana</i> (Lobatse Hinge-Back Tortoise; VU).</li> </ul>
<p><b>PLANT SPECIES THEME</b> (Figure 24)</p>	<p>For the plant species theme, the entire application area is considered to have a <b>medium sensitivity</b>.</p> <p>The medium sensitivity was triggered by potential suitable habitat for Sensitive species 1252 (VU), Sensitive species 587 (Rare), Sensitive species 124 (CR), <i>Cymbopappus piliferus</i> (VU), <i>Polygala sekhukhuniensis</i> (VU), Sensitive species 1167 (VU), <i>Streptocarpus latens</i> (Rare), <i>Searsia sekhukhuniensis</i> (Rare), <i>Khadia alticola</i> (Rare), <i>Combretum petrophilum</i> (Rare), Sensitive species 691 (VU), Sensitive species 998 (EN), Sensitive species 1086 (EN), and <i>Hesperantha bulbifera</i> (Rare).</p>
<p><b>TERRESTRIAL BIODIVERSITY THEME</b> (Figure 25)</p>	<p>For the terrestrial biodiversity theme, the entire application area is considered to have an overall <b>sensitivity of very high</b>. The trigger biodiversity themes are:</p> <ul style="list-style-type: none"> <li>- Critical Biodiversity Area 2 (refer to results of the 2018 Limpopo C-Plan);</li> <li>- FEPA Sub-catchments;</li> <li>- Endangered ecosystem (Corresponding with the National Threatened Ecosystems Database; 2011), and</li> <li>- Protected Areas Expansion Strategy.</li> </ul>

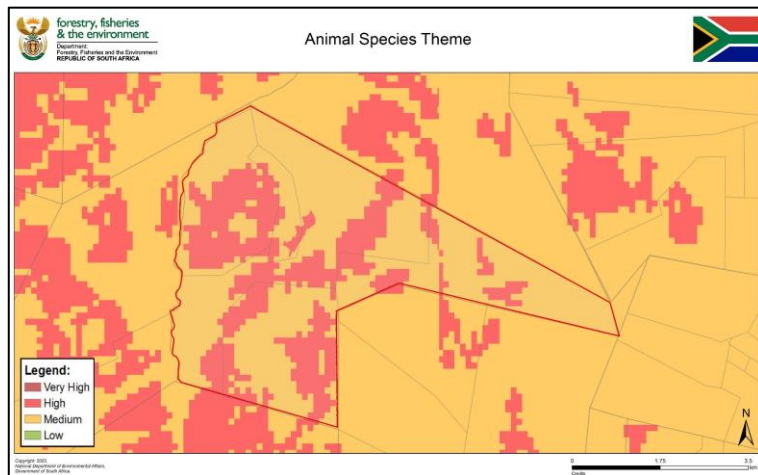


Figure 23: Screening tool outcome for the animal species theme

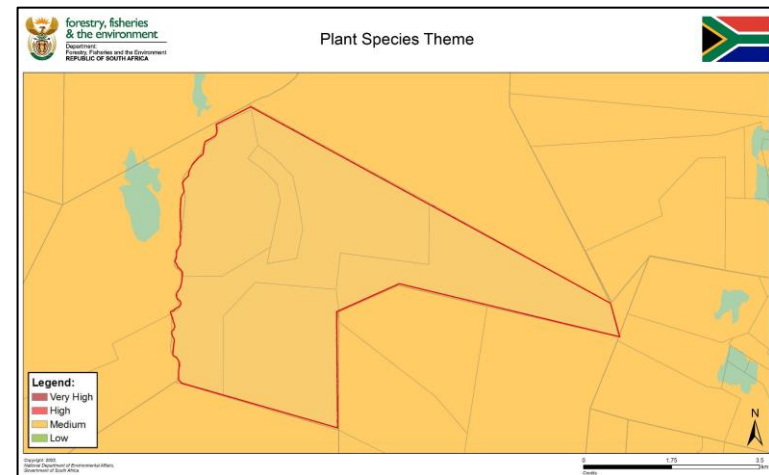


Figure 24: Screening tool outcome for the plant species theme

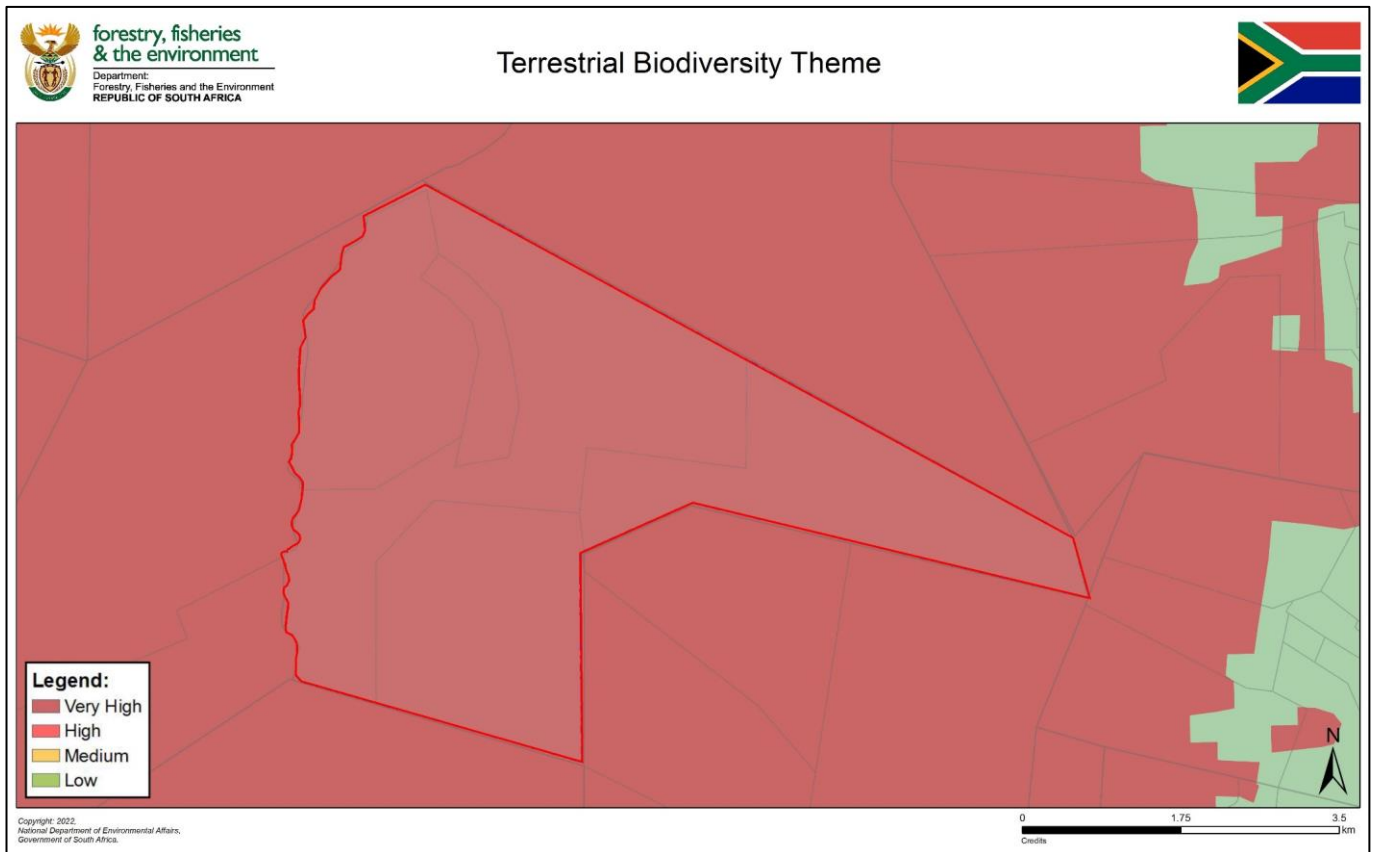


Figure 25: Screening tool outcome for the terrestrial combined biodiversity theme

### **Flora Field-Verified Results**

The application area is largely associated with natural landscapes characterised by both bushveld and grassland communities interspersed with various freshwater features. Anthropogenic-related land uses associated with the application area and surrounds include mining and agriculture, albeit small and localised in extent. The vegetation communities associated with the application area have therefore retained most of its habitat integrity, and ecological processes are minimally altered/impered within the non-transformed sections. Areas closer to the anthropogenic land uses have inevitably experienced edge effects from e.g., overgrazing, fragmentation, and/or alien and invasive plant (AIP) proliferation. These edge effects have resulted in altered vegetation communities and a shift away from the reference vegetation types in these areas.

The below broad habitat units could be distinguished within the application area:

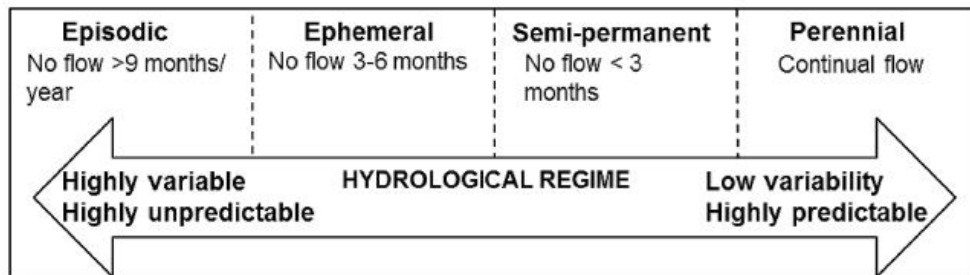
➤ **Degraded Habitat:**

- Secondary Bushveld (historically cultivated and areas experiencing significant edge effects) and Transformed Habitat (mining-related).



➤ **Freshwater Habitat<sup>11</sup>.** The below grouping is based on similarities in vegetation structure and species composition. For a breakdown of the Freshwater Habitat into Hydrogeomorphic (HGM) units, please refer to the Freshwater Ecological Verification Report:

- An Artificial Feature, Ephemeral and Episodic Drainage Lines (EEDLs), Rivers and Streams (including two Perennial Streams and the Groot-Dwars River), and Wetlands (comprising a Channelled Valley Bottom and several smaller Seep Wetlands).



➤ **Montane Grassland:**

- Sekhukhune Montane Grassland and Steenkampsberg Montane Grassland.

➤ **Sekhukhune Mountain Bushveld:**

- Open Bushveld, Mountain Bushveld, and Wooded Cliffs.

The above habitat units are presented in **Figure 26** below.

<sup>11</sup> The Freshwater Habitat encompasses true watercourses. In terms of the definition contained within the National Water Act, 1998 (Act No. 36 of 1998), a watercourse means:

- A river or spring;
  - A natural channel which water flows regularly or intermittently;
  - A wetland, dam or lake into which, or from which, water flows; and
  - Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse;
- and a reference to a watercourse includes, where relevant, its bed and banks.

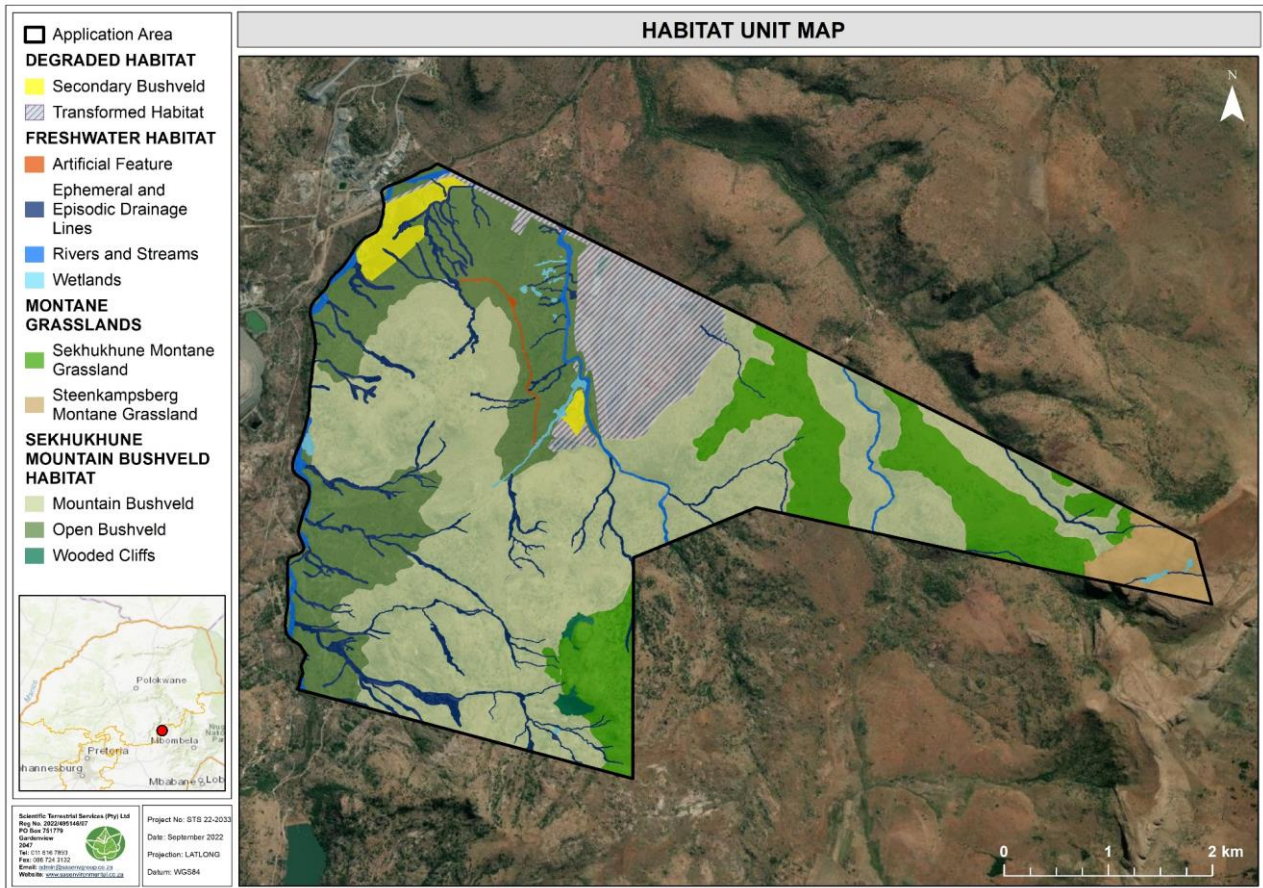


Figure 26: Habitat units associated with the application area



Four broad habitat units have been distinguished for the application area. The floral ecology of these habitat units is briefly discussed below, with the outcome of the Screening Tool (i.e., the plant species theme and terrestrial biodiversity theme) verified or disputed at the end of each section.

Table 25: Degraded habitat (Secondary Bushveld and Transformed Habitat sub-units)

### HABITAT OVERVIEW

The Transformed Habitat includes areas where significant current modification to the vegetation communities exists (e.g., vegetation cleared for mining operations and road development), whereas the Secondary Bushveld includes areas that are currently vegetated but have received either significant modification in the past (e.g., historically cultivated fields) or are currently subjected to edge effects that have resulted in degraded vegetation communities. See representative photos below:



**Mining operations depicted in the left photo, with historically cultivated fields dominated by *Heteropogon contortus* depicted in the right photo.**

The Transformed Habitat is associated with a low species richness and typically included a close association with AIP species that are able to colonise in such disturbed habitat. As such, the Transformed Habitat does not retain any semblance to the reference vegetation type (i.e., the Sekhukhune Mountain Bushveld). The Secondary Bushveld was associated with moderately low species richness and were homogenous in their floral compliment, dominated by grasses that indicate poor veld conditions (namely *Cymbopogon* spp., *Heteropogon contortus* and *Hyparrhenia* spp.) – as such, no remnants of the reference state remain.



**BIODIVERSITY PRIORITY AREAS<sup>12</sup>**

CBA 2	EN Sekhukhune Mountainlands Ecosystem	NPAES Priority Focus Area	Highest Biodiversity Importance Area (Mining and Biodiversity Guidelines)
Not applicable. Extent of modification prevents the CBA to function in a way that will allow regional biodiversity targets to be met.	Not applicable. None of the key biodiversity features of the EN ecosystem are present in these sub-units.	Not applicable. Sub-units not deemed ideal for protected area expansion in their current modified state.	Not applicable. No biodiversity of significance is present in these sub-units.

**PLANT SPECIES OUTCOME<sup>13</sup>**

Due to the extent to which natural floral community structure and composition have been altered by anthropogenic activities, floral SCC are less likely to establish viable populations (if any), especially within areas that have been completely transformed. No red data listed (RDL) species identified by the Screening Tool, the Threatened or Protected Species (TOPS) list (2007 Regulations), or Section 56 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), are associated with these habitat sub-units.

Species protected under the National Forest Act, 1998 (Act No. 84 of 1998) (NFA) and the Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA) may be present but will not be abundant, as favourable habitat is more abundant in the neighbouring less disturbed habitat units. The medium sensitivity for the plant species theme generated by the Screening Tool is not supported for this habitat unit and its sub-units; instead, a low sensitivity is recommended.

**SCREENING TOOL VERIFICATION**

Plant Species Theme		Terrestrial Biodiversity Theme	
Screening Tool Sensitivity	Verified Sensitivity	Screening Tool Sensitivity	Verified Sensitivity
Medium	Low	High	Low

<sup>12</sup> **BIODIVERSITY PRIORITY AREAS:** Protected Areas, Critically Endangered and Endangered ecosystems, Critical Biodiversity Areas and Ecological Support Areas, Freshwater Ecosystem Priority Areas, high water yield areas, flagship free-flowing rivers, priority estuaries, Priority Areas for land-based protected area expansion.

<sup>13</sup> **PLANT SPECIES OUTCOME:** As part of the SCC assessment, the following classes were considered:

- **Threatened species.** In terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), threatened species are Red Data Listed (RDL) species falling into the following categories of ecological status: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected in terms of the NEMBA Threatened or Protected Species (TOPS) Regulations (General Notice (GN) R152 of 2007, as amended). Removal, translocation and/or destruction of these species require authorisation from the DFFE.
- **Protected Species.** Species that do not necessarily fall in the above categories of ecological status, but that are deemed important from a provincial biodiversity perspective, e.g., LEMA provides a list of Specially Protected Plants (Schedule 11) and Protected Plants (Schedule 12) for the Limpopo Province for which restricted activities may not occur without permits from the relevant provincial authorities. The List of Protected Tree Species (GN No. 536) as published in the Government Gazette 41887 dated 7 September 2018 as it relates to the NFA was also considered for the SCC assessment.

Table 26: Freshwater habitat

### HABITAT OVERVIEW

The **EEDLs** are scattered throughout the application area, often typified by deeply incised channels. Within the application area, the EEDLs account for the largest portion of the Freshwater Habitat unit, and are associated with periodic, or temporary, surface water, i.e., flowing water occurs only during, and for a short duration after, precipitation events in a typical year. The vegetation of the EEDLs is characterised by a variable riparian<sup>14</sup> zone; however, within the variable riparian zones, several broad vegetation communities can be distinguished for the EEDLs; each community varying in vegetation structure and species composition depending on the associated terrain. Overall, these systems are in a good ecological condition.

Refer to below representative photos:



The **Wetlands** include systems associated with seep wetlands and channelled valley bottom wetlands (please refer to the Freshwater Report for further details) where the vegetation is characterised by a well-represented herbaceous and graminoid layer, and generally lacking a woody component. The Wetlands are mostly located in the central section of the application area; however, isolated wetlands are also found in the western and eastern sections of the application area. Ecologically, the Wetlands are considered important systems that contribute to overall floral species diversity in the area – providing specialised and niche habitat for especially forbs and sedges that are not represented elsewhere in the application area. Wetlands within the Montane Grasslands (i.e., those in the eastern extent of the application area) are deemed of very high ecological importance due to the greater floral diversity supported therein and due to their seclusion from anthropogenic activities which has resulted in improved habitat integrity.

Refer to below representative photos:

<sup>14</sup> **National Water Act, 1998 (Act 36 of 1998) (NWA):** “Riparian Habitat” includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.



Photos a) – b) include grass- and sedge-rich wetlands associated with the bushveld communities (western and central sections of the application area). Photos c) – d) include wetlands associated with the higher altitude montane grassland communities (i.e., far eastern section).

The **Rivers and Streams** include systems associated with perennial streams<sup>15</sup> and include the Groot-Dwars River, Mareesburg Stream (a tributary of the Groot-Dwars River), and higher altitude, mountain streams. These systems, being associated with a more permanent surface water than the EEDLs, have different vegetation communities, including a higher abundance and diversity of graminoid species. This habitat sub-unit is located throughout the application area, with the Groot-Dwars River running along the western extent of the application area, the Mareesburg Stream running through the central section of the application area, and the mountain streams located in the eastern portion of the application area. These systems are in a fair to excellent ecological condition and support important ecological processes in the area.

Refer to below representative photos:



<sup>15</sup> A **perennial stream or perennial river** is a stream or river (channel) which has a flow of water throughout the year through at least parts of its stream bed during years of normal rainfall. [Meinzer, O.E., 1923. Outline of ground-water hydrology, with definitions: US Geol. Survey Water-Supply Paper, 494(71), p.1923b.].



**River and Stream communities. Photo a): Habitat associated with the Groot Dwars River. Photo b): Habitat associated with the Mareesburg stream. Photos c) - d): Higher-altitude Mountain streams.**

**BIODIVERSITY PRIORITY AREAS**

CBA 2	EN Sekhukhune Mountainlands Ecosystem	NPAES Priority Focus Area	Highest Biodiversity Importance Area (Mining and Biodiversity Guidelines)
Confirmed functioning.	Confirmed. Key biodiversity features present (i.e., especially in terms of plant species within the EEDLs).	Confirmed. Adequate habitat connectivity is present, as well as suitable biodiversity features that would necessitate protection/conservation, and hence considered a good candidate for protected area expansion.	Confirmed. Several priority biodiversity features are associated with this habitat unit.

**PLANT SPECIES OUTCOME**

SPECIES NAME	Probability of Occurrence (POC)	STATUS	SPECIES NAME	POC	STATUS
<i>Alepidea attenuata</i>	Medium	NT	<i>Mystacidium cf. capense</i>	Confirmed	LC. LEMA
<i>Balanites Maughamii</i>	High	LC. NFA	<i>Polygala sekhukhuniensis</i>	Low	VU
<i>Berchemia zeyheri</i>	Confirmed	LC. NFA	<i>Scadoxys puniceus</i>	Confirmed	LC. LEMA
<i>Catha edulis</i>	High	LC. NFA	<i>Searsia sekhukhuniensis</i>	Low	Rare
<i>Combretum petrophilum</i>	Low	Rare	<i>Streptocarpus latens</i>	Low	Rare
<i>Cymbopappus pilliferus</i>	Medium	VU	Sensitive species 124	Low	CR
<i>Disa alticola</i>	Medium	VU	Sensitive species 587	Confirmed	Rare
<i>Hesperantha bulbifera</i>	Medium (SMG <sup>16</sup> )	Rare	Sensitive species 691	Medium	VU
<i>Khadia alticola</i>	Low	Rare	Sensitive species 998	Medium	EN
<i>Liparis bowkeri</i>	Confirmed	LC. LEMA	Sensitive species 1086	Medium	EN
<i>Ledebouria megaphylla</i>	Confirmed	VU	Sensitive species 1167	Low	VU
<i>Lydenburgia cassinoides</i>	Confirmed	NT, NFA	Sensitive species 1252	Confirmed	VU
<i>Merwillia plumbea</i>	Confirmed	NT. LEMA			

**SCREENING TOOL VERIFICATION**

Plant Species Theme		Terrestrial Biodiversity Theme	
Screening Tool Sensitivity	Verified Sensitivity	Screening Tool Sensitivity	Verified Sensitivity
Medium	High recommended	High	High

<sup>16</sup> Where the Freshwater Habitat occurs in the Sekhukhune Montane Grassland or SMG

Table 27: Montane Grasslands

### HABITAT OVERVIEW

The unit is regarded representative of the reference states, namely the Sekhukhune Montane Grassland (southern and eastern sections of the application area) and the Steenkampsberg Montane Grassland (far eastern section of the application area). When compared to the Freshwater Habitat and the Sekhukhune Mountain Bushveld habitat within the application area, the distribution of the Montane Grasslands is more restricted in its extent; typically occurring at higher elevations (1 300 m – 1 800 m a.s.l.), as opposed to the bushveld communities that only extend to 1 600 m a.s.l. Very little impacts to the Montane Grasslands within the application area were evident and as such, primary grassland<sup>17</sup> conditions predominate in this habitat units. The overall habitat integrity and ecological function is considered high, and no impediment to natural ecological processes were noted. Floral diversity was high for this habitat unit and the forb component was especially well-represented.

The Steenkampsberg Montane Grassland not only occurs at a higher elevation than the Sekhukhune Montane Grassland but was also represented by unique geology. Floral communities supported in the Sekhukhune Montane Grassland and Steenkampsberg Montane Grassland seems to be very different; however, due to recent burning in the Steenkampsberg Montane Grassland at the time of assessment, vegetation communities are under surveyed in this sub-unit. The Sekhukhune Montane Grassland supports a higher diversity of forbs, whereas the Steenkampsberg Montane Grassland supports a higher diversity of succulents.

Refer to below representative photos:



Representative photos of the Sekhukhune Montane Grassland sub-unit. Forb species are well-represented. The first photo is a general habitat photo, followed by grassland forbs unique to the sub-unit, namely (from left to right): *Gladiolus longicollis*, *Hypoxis galpinii*, *Streptocarpus dunnii*, and one of the many bulbous plants.

<sup>17</sup> Some grasslands can be distinguished from each other based on the extent of modification they have undergone (SANBI, 2013):

- **Primary grasslands** are those that have not been significantly modified from their original state; even though they may no longer have their full complement of naturally occurring species, they have not undergone significant or irreversible modification and still retain their essential ecological characteristics.
- **Secondary grasslands** are those that have undergone extensive modification and a fundamental shift from their original state (e.g., to cultivated areas), but have then been allowed to return to a 'grassland' state (e.g., when old, cultivated lands are re-colonised by a few grass species). Although secondary grasslands may superficially look like primary grasslands, they differ markedly with respect to species composition, vegetation structure, ecological functioning and the ecosystem services they deliver.



Representative photos of the Steenkampsberg Montane Grassland sub-unit. Succulent species are well-represented. The first photo is a general habitat photo with *Cotyledon* in the foreground, followed by grassland succulents unique to the sub-unit, namely (from left to right): *Anacampteros subnuda*, *Huernia zebrina*, *Crassula setulosa*, and *Euphorbia clavarioides*.

### BIODIVERSITY PRIORITY AREAS

CBA 2	EN Sekhukhune Mountainlands Ecosystem	NPAES Priority Focus Area	Highest Biodiversity Importance Area (Mining and Biodiversity Guidelines)
Confirmed functional.	Confirmed. Several key biodiversity features of the EN ecosystem are associated present in this habitat unit (both vegetation types and plant species).	Confirmed. Adequate habitat connectivity is present, as well as suitable biodiversity features that would necessitate protection/conservation, and hence considered a good candidate for protected area expansion.	Confirmed. Several priority biodiversity features are associated with this habitat unit.

### PLANT SPECIES OUTCOME

SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Alepidea attenuata</i>	Medium	NT	<i>Polygala sekhukhuniensis</i>	Low	VU
<i>Aloe reitzii</i>	Medium	NT.	<i>Searsia sekhukhuniensis</i>	Low	Rare
<i>Combretum petrophilum</i>	Low	Rare	<i>Streptocarpus latens</i>	Low	Rare
<i>Cymbopappus piliferus</i>	High (SMG)	VU	Sensitive species 92	Confirmed	VU. LEMA. TOPS
<i>Disa alticola</i>	Medium	VU. LEMA	Sensitive species 124	Low	CR
<i>Hesperantha bulbifera</i>	Low	Rare	Sensitive species 587	Low	Rare
<i>Huernia zebrina</i> subsp. <i>insigniflora</i>	Confirmed	LC. LEMA	Sensitive species 691	Medium	VU
<i>Khadia alticola</i>	Low	Rare	Sensitive species 998	Medium	EN
<i>Merwillia plumbea</i>	Confirmed	NT. LEMA	Sensitive species 1086	Medium	EN
<i>Pearsonia hirsuta</i>	High	VU	Sensitive species 1167	Confirmed	VU
<i>Protea parvula</i>	Medium	NT	Sensitive species 1252	Low	VU

### SCREENING TOOL VERIFICATION



Plant Species Theme		Terrestrial Biodiversity Theme	
Screening Tool Sensitivity	Verified Sensitivity	Screening Tool Sensitivity	Verified Sensitivity
Medium	High recommended	High	High

Table 28: Sekhukhune Mountain Bushveld

### HABITAT OVERVIEW

There is great variability in the habitat associated with the bushveld communities. The habitat unit could, however, be divided into three sub-units based on their presence in the landscape and some key differences in vegetation communities. Vegetation communities associated with the sheetrock formations are scattered throughout the application area and is interspersed between both the Sekhukhune Mountain Bushveld habitat unit and the Montane Grassland habitat unit.

The **Open Bushveld** sub-unit occurs along the footslopes of the mountains in the western and the northern sections of the application area, generally occurring below 1120 m above sea level (a.s.l.). High variability in vegetation structure and species composition were evident throughout this sub-unit, ranging from short-to-tall open shrubland (*Euclea sekhukhuniensis*- *Elephantorrhiza praetermissa*-*Grewia vernicosa* communities), microphyllous dominated habitat (*Vachellia karroo*-*Grewia flava*-*Bolusanthes speciosa* communities in the north), and open bushveld habitat with a good representation of both broadleaf shrubs and trees (*Combretum apiculatum*-*Peltophorum africanum* communities in the east). Natural ecological processes are moderately modified (fragmentation and loss of habitat integrity), but still able to support diverse floral communities and has enough resilience to limit AIP proliferation and bush encroachment. Refer to representative photos below:



Typical habitat associated with the Open Bushveld within the application area.

The **Mountain Bushveld** sub-unit is the largest of the sub-units associated with the application area. This sub-unit is associated with mountainous terrain generally occurring above 1120 m a.s.l., but below 1600 m a.s.l. A greater diversity in the broadleaf floral communities is associated with this sub-unit but like the Open Bushveld, the variability on the vegetation communities is high. Despite appearing to be homogenous in its vegetation structure and composition, the floral communities are distributed in a mosaic-like pattern. The aspect of the hills, steepness of the hills, and biophysical nature (especially rockiness) of the habitat contributes greatly to vegetation structure and composition. Poaching in the area has resulted in some herbivore exclusion and could impact on savanna ecology in the long term; however, at present no immediate impacts from herbivore exclusion are evident. Most of this sub-unit has retained high levels of habitat integrity and thus natural processes and dispersal corridors are largely intact. Refer to representative photos below:





Typical habitat associated with the Mountain Bushveld within the application area.

Comprising a small extent within the application area (southern portion), the **Wooded Cliffs** differs from the others in that the woody composition is better represented, forming thickets with a closed canopy cover. Evergreen trees are also better represented in the Wooded Cliffs than in the Mountain or Open Bushveld sub-units. The patchy distribution of the Wooded Cliffs within the hilly and mountainous areas are due to their formation being so closely associated with fire patterns. Within mountain kloofs<sup>18</sup>, Wooded Cliffs (and often forests) are protected from fire. The sharp change in topography from mountain slopes to kloof or drainage lines prevents fire from reaching these areas and this results in a rapid (or sharp) transition from grassland and bushveld communities to kloof thickets. The Wooded Cliffs have been excluded from anthropogenic impacts and are still able to support diverse floral communities. Refer to representative photos below:



Typical habitat associated with the Wooded Cliffs within the application area.

BIODIVERSITY PRIORITY AREAS			
CBA 2	EN Sekhukhune Mountainlands Ecosystem	NPAES Priority Focus Area	Highest Biodiversity Importance Area (Mining and Biodiversity Guidelines)
Confirmed functional.	Confirmed. Several key biodiversity features of the EN ecosystem are associated present in this habitat unit (both vegetation types and plant species).	Confirmed. Adequate habitat connectivity is present, as well as suitable biodiversity features that would necessitate protection/conservation, and hence	Confirmed. Several priority biodiversity features are associated with this habitat unit.

<sup>18</sup> (In South Africa) a steep-sided, wooded ravine or valley. (noun): deep valley with high straight sides.



			considered a good candidate for protected area expansion.		
PLANT SPECIES OUTCOME					
SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Berchemia zeyheri</i>	Confirmed	NFA	<i>Polygala sekhukhuniensis</i>	Medium	VU
<i>Brachystelma</i> spp.	High	LEMA	<i>Scadoxis puniceus</i>	Confirmed	LEMA.
<i>Ceropegia</i> spp.	High	LEMA	<i>Sclerocarya birrea</i> subsp. <i>caffra</i>	Confirmed	NFA
<i>Combretum petrophilum</i>	Medium-High	Rare	<i>Searsia sekhukhuniensis</i>	Medium	Rare
<i>Cymbopappus piliferus</i>	Low	VU	<i>Streptocarpus latens</i>	Low	Rare
<i>Dicliptera fruticosa</i>	High	NT	<i>Stapelia</i> spp.	Medium	LEMA.
<i>Elaeodendron transvaalense</i>	Confirmed	NT. LEMA	Sensitive species 92	Confirmed	VU. LEMA. TOPS
<i>Elephantorrhiza praetermissa</i>	Confirmed	Rare. LEMA	Sensitive species 124	High	CR
<i>Hesperantha bulbifera</i>	Low	Rare	Sensitive species 587	Confirmed	Rare
<i>Jamesbrittenia macrantha</i>	Confirmed	NT. LEMA	Sensitive species 691	Medium	VU
<i>Khadia alticola</i>	Low	Rare	Sensitive species 998	Low	EN
<i>Lydenburgia cassinoides</i>	Confirmed	NT. NFA	Sensitive species 1086	Low	EN
<i>Merwillia plumbea</i>	Confirmed	NT. LEMA	Sensitive species 1167	Confirmed	VU. LEMA. TOPS
<i>Orbea</i> spp.	Medium	LEMA	Sensitive species 1252	High	VU
<i>Pittosporum viridiflorum</i>	Confirmed	NFA			
SCREENING TOOL VERIFICATION					
Plant Species Theme			Terrestrial Biodiversity Theme		
Screening Tool Sensitivity	Verified Sensitivity		Screening Tool Sensitivity	Verified Sensitivity	
Medium	High recommended		High	High	

### **Faunal Field-Verified Results**

Fauna have been broken down into four groups: mammals, avifaunal, herpetofauna and invertebrates. The faunal ecology of these groups is briefly discussed below, with the outcome of the Screening Tool (i.e., the animal species theme) verified or disputed at the end of each section.

Table 29: Mammals

#### MAMMAL OVERVIEW

Mammals were abundant and observed throughout the application area ranging from smaller species like: *Aethomys chrysophilus* (Red Veld Rat) and *Atilax paludinosus* (Marsh mongoose), to larger carnivores and meso-carnivores such as: *Parahyaena brunnea* (Brown Hyaena), *Panthera pardus* (Leopard), *Caracal caracal* (Caracal) and *Canis mesomelas* (Black-backed Jackal). Larger herbivores were also noted within the application area; *Giraffa camelopardalis* (Giraffe), *Equus quagga* (Plain's Zebra), *Connochaetes taurinus* (Blue Wildebeest) and *Tragelaphus strepsiceros* (Greater Kudu) to name a few.

The uniqueness of the region, with its higher altitude mountainous terrains, low lying valley floors, montane grasslands interspersed with drainage lines, wetlands and rivers provides a variety of suitable habitat conditions for mammal species. In comparison to the surrounding regions, and notably much of Sekhukhuneland, the application area is located within a local setting which is managed as a natural ecological system with extensive habitat for mammals. Habitat integrity has been marginally compromised as a result of increasing mining operations in the surrounding and immediate areas, however, the remaining natural areas as well as those within the application area contain adequate habitat, food and water resources to sustain a diversity of mammals.

Six mammal SCC have been recorded within the application area, with a further six having either a medium or high POC. This further highlights the importance and sensitivity of the application area in terms of conserving mammal SCC. Ecological connectivity within the application area itself is largely intact, whilst connectivity between the surrounding areas is mostly intact with the exception of the areas to the north, which are more heavily mined and fenced off.



a) *Parahyaena brunnea* (Brown Hyaena); b) *Caracal caracal* (Caracal); c) *Potamochoerus larvatus* (Bushpig); and d) *Panthera pardus* (Leopard).



e) *Giraffa camelopardalis* (Giraffe); f) *Equus quagga* (Plain's Zebra); g) *Aonyx capensis* (Cape Clawless Otter) scat found along the banks of the Groot Dwars River; h) *Genetta tigrina* (Large-Spotted Genet) and i) *Canis mesomelas* (Black-backed Jackal).

**MAMMAL SPECIES OUTCOME**

SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Panthera pardus</i> (Leopard)	Confirmed	VU	<i>Hydrictis maculicollis</i> (Spotted-Necked Otter)	Medium	VU
<i>Parahyaena brunnea</i> (Brown Hyaena)	Confirmed	VU	<i>Crocidura maquassiensis</i> (Makwassie Musk Shrew)	Medium	VU
<i>Rhinolophus smithersi</i> (Smither's Horseshoe Bat)	Confirmed	NT	<i>Amblysomus robustus</i> (Robust Golden Mole)	Medium	VU
<i>Redunca fulvorufula</i> (Mountain Reedbuck)	Confirmed	EN	<i>Chrysospalax villosus</i> (Rough-Haired Golden Mole)	Medium	VU
<i>Aonyx capensis</i> (Cape Clawless Otter)	Confirmed	NT	<i>Felis lybica</i> (African Wild Cat)	High	VU
<i>Leptailurus serval</i> (Serval)	Confirmed	NT	<i>Lycaon pictus</i> (African Wild Dog)	Low	EN
<i>Rhinolophus cohenae</i> (Cohen's Horseshoe Bat)	High	NT	<i>Ourebia ourebi ourebi</i> (Oribi)	Low	EN

**SCREENING TOOL VERIFICATION**

**Animal Species Theme**

Screening Tool Sensitivity	Verified Sensitivity
Medium	High recommended

High

High recommended

Table 30: Avifauna

### AVIFAUNAL OVERVIEW

Throughout the application area a diversity of avifaunal species were observed as a result of the varied topography and associated habitats. Such landscape and vegetation structure (wooded and open valleys, rocky hillsides, wetlands, rivers, high elevation and montane grasslands) are commonly accepted as a primary determinant for avifaunal diversity. The application area caters for an abundance of habitat and food resources for avifauna. The mountainous areas with their well wooded drainage lines, rocky outcrops and dense shrub and tree layers with altering height offered structurally diverse habitat for avifauna. Vegetative diversity, provide increased food resources (plant material, seeds, insects and small mammals) and areas of refuge for avifauna as well as suitable nesting opportunities and vantage points for raptors. The open bushveld, drainage lines and riparian vegetation along the Groot Dwars River were dominated by insectivorous, granivorous and mixed feeders as well as species that are often associated with freshwater systems.

Three avifaunal SCC were recorded from the application area whilst a further eleven have a medium / high POC for the application area. Although there was a low observation rate of avifaunal SCC, it is likely attributed to the nature of these species, often flying off before direct observations can be made and the relatively small numbers they occur in.



a) *Halcyon albiventris* (Brown-hooded Kingfisher); b) *Nectarinia famosa* (Malachite Sunbird); c) *Chalcomitra amethystina* (Amethyst Sunbird); d) *Scleroptila shelleyi* (Shelley's Francolin).



e) *Circaetus pectoralis* (Black-chested snake eagle); f) *Buphagus erythrorhynchus* (Red-Billed Oxpecker); g) *Aquila spilogaster* (African Hawk-eagle) and h) *Circaetus cinereus* (Brown Snake Eagle).

**AVIFAUNAL SPECIES OUTCOME**

SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Gyps africanus</i> (White Backed Vulture)	Confirmed	CR	<i>Aquila rapax</i> (Tawny Eagle)	High	EN
<i>Torgos tracheliotos</i> (Lappet Faced Vulture)	Medium	VU	<i>Stephanoaetus coronatus</i> (Crowned Eagle)	High	EN
<i>Gyps coprotheres</i> (Cape Vulture)	Confirmed	VU	<i>Neotis denhami</i> (Denham's Bustard)	Medium	NT
<i>Polemaetus bellicosus</i> (Martial Eagle)	High	VU	<i>Falco biarmicus</i> (Lanner Falcon)	High	VU
<i>Aquila verreauxii</i> (Verreauxs Eagle)	High	VU	<i>Podica senegalensis</i> (African Finfoot)	Medium	VU
<i>Buphagus erythrorhynchus</i> (Red-Billed Oxpecker)	Confirmed	T (SoER (2004))	<i>Eupodotis senegalensis</i> (White-bellied Korhaan)	Medium	VU
<i>Geronticus calvus</i> (Southern Bald Ibis)	High	VU	<i>Hydroprogne caspia</i> (Caspian Tern)	Low	VU
<i>Anthus chloris</i> (Yellow-Breasted Pipit)	Medium	VU			

**SCREENING TOOL VERIFICATION**

**Animal Species Theme**

Screening Tool Sensitivity	Verified Sensitivity
Medium	High recommended
High	High recommended



Table 31: Herpetofauna

### HERPETOFAUNAL OVERVIEW

Many common and endemic species were observed during the site visits, with the highest diversity of reptiles occurring in the Sekhukhune Mountain Bushveld and rocky outcrops within. As the application area is largely undisturbed by mining and land transformation activities, it keeps a wide range and complexity of habitats suitable for reptile species. Although habitat for reptiles in the application area is abundant, observation rates of reptiles is often limited during surveys of shorter durations, notably as reptiles are inherently secretive and shy, making their detection and identification in the field challenging. Online databases for the area and region were used to supplement infield data. The Sekhukhune Mountain Bushveld, being the dominant habitat in the application area, provides high levels of habitat provision for reptiles, notably areas of refuge as well as suitable basking sites because of the abundance of rocky outcrops. Food resources like insects and small mammal species were abundant within this habitat. The montane grassland is largely undisturbed especially in the north-eastern corner of the application area; however, the decreased woody cover and lower abundances/diversity of food resources (insects and small mammals) resulted in lower observations of reptiles within this habitat. The drainage lines and Groot Dwars River are well wooded, providing ample cover and have an abundance of suitable food resources for reptiles, notably insectivores.

Amphibian diversity within the application area appears to be moderate, with most amphibian species observed in association with the freshwater habitats. Some moisture independent species were observed considerable distance from water sources. During the rainy season however, when the drainage lines and other areas of water collection (depressions in the landscape and rocky areas) do contain water, many amphibian species will make use of these water bodies for breeding purposes. During the winter months, it is likely that many amphibians, notably moisture independent species, will likely go into a state of aestivation, slowing down their metabolic rates and as such, their food intake requirements. Amphibian species predominantly rely on insects as a source of food, with some species also preying upon small arachnids. Invertebrate diversity will increase exponentially during the summer months, throughout the application area, providing ample food resources for amphibians. The increase in invertebrate numbers during this period is critical for amphibians, not only to replenish lost energy reserves post winter, but also to ensure that they have sufficient energy for breeding.

Four reptile SCC were recorded from the application area. No amphibian SCC were recorded, nor are any such species likely to occur within the application area. The application area is considered of increased importance for herpetofauna, providing highly suitable habitat for a diversity of species. During the site assessments, it was evident that the drainage lines that cover the study are well utilised by herpetofauna for breeding (amphibians) as well as movement corridors and foraging grounds (amphibians and reptiles).



a) *Gerrhosaurus flavigularis* (Yellow-throated Plated Lizard); b) *Platysaurus orientalis fitzsimonsi* (Fitzsimons's Flat Lizard); c) *Platysaurus orientalis orientalis* (Sekhukhune Flat Lizard); d) *Chondrodactylus turneri* (Turner's Thick-toed Gecko) and e) *Pachydactylus vansoni* (Van Son's Thick-toed Gecko).



f) *Agama atra* (Southern Rock Agama); g) *Chamaeleo dilepis* (Flap-Necked Chameleon); h) *Psammophis brevirostris* (Short-snouted Whip Snake); i) *Lycophidion variegatum* (Variegated Wolf Snake) and j) *Aparallactus capensis* (Cape Centipede-Eater).



k) *Pachydactylus affinis* (Transvaal Thick-Toed Gecko); l) *Kinixys lobatsiana* (Lobatse Hinge-backed Tortoise); m) *Amietia delalandii* (Delalande's River Frog); n) *Psammophis subtaeniatus* (Stripe-bellied Sand Snake).

**HERPETOFAUNAL SPECIES OUTCOME**

SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Kinixys lobatsiana</i> (Lobatse Hinge-backed Tortoise)	Confirmed	VU	<i>Homoroselaps dorsalis</i> (Striped Harlequin Snake)	Medium	NT
<i>Platysaurus orientalis orientalis</i> (Sekhukhune Flat Lizard)	Confirmed	Endemic	<i>Python natalensis</i> (Southern African Rock Python)	Medium	P (TOPS)
<i>Platysaurus orientalis fitzsimonsi</i> (Fitzsimon's Flat Lizard)	Confirmed	NT	<i>Pachydactylus affinis</i> (Transvaal Thick-Toed Gecko)	Confirmed	Endemic

**SCREENING TOOL VERIFICATION**

**Animal Species Theme**



Screening Tool Sensitivity	Verified Sensitivity
Medium	High recommended

Table 32: Invertebrates

### INVERTEBRATE OVERVIEW

The Sekhukhune Mountain Bushveld and the Freshwater habitats provide ideal habitat for invertebrates with the highest abundances and diversity observed herein. Although the Montane Grassland is largely intact and not disturbed, the invertebrate diversity and abundance was lower in comparison to the other habitats. It is however important to note that invertebrate species found within the montane grassland may associate with specific flora within and may not be found in the other habitat units, and vice versa. Coleopterans, Lepidopterans, Orthopterans and Dipterans were the most abundant orders observed within the application area during the site assessments. The application area, due to the structural diversity of habitats and floral species, provides an abundance of food resources for insect species. Water associated species in the order Odonata (Dragon and Damselflies) were commonly observed within the freshwater habitats.

Arachnid species are notably harder to detect because their natural threat avoidance habits and their tendency to seek refuge during the daylight hours. During the site assessment the presence of arachnids was observed mostly in the rocky habitats and wooded areas. The abundance of insect species and small reptiles, indicates that food abundance for arachnids is high within the application area, whilst the vegetation diversity and varying soil and rock substrates provides a varied selection of habitats for arachnids, notably burrowing species, ground hunting species, ambush species as well as plant dwelling and web building species.

The intact habitat and ecological functioning within the application area ensures that invertebrate species are well represented and abundant in the application area. Invertebrates are usually the most abundant macro-organisms within landscapes and often perform services vitally important for ecosystem functioning. Insects serve as pollinators, remove detritus material, bury dung and associated parasites below the surface helping to cycle nutrients back into the soil while decreasing the parasitic load within an environment, reducing the risk of disease. High invertebrate abundance and diversity can indicate a healthy functioning landscape as they play important roles within ecosystems.

During the site assessment four invertebrate SCC were found within the application area, whilst a further two species have a medium and high POC. The unique location and vegetation type of the application area has resulted in an increased diversity of invertebrates, some of which are not known to occur outside of the Dwars Valley system. The application area is considered to be of increased importance for invertebrate species. It is important to preserve habitat for this important and largely understudied faunal group.



a) *Hadogenes polytrichobothrius* (Flat Rock Scorpion); b) *Cheloctonus intermedius* (Intermediate Creeper); c) *Opisthophthalmus glabrifrons* (Burrowing scorpion); d) *Harpactirella overdijki* (Lesser Baboon Spider) and e) *Dresserus sp* (Ground Velvet Spiders).



f) *Camponotus maculatus* (Spotted Sugar Ant); g) *Anthia thoracica* (Two-spotted Ground Beetle); h) Family Lampyridae (Fireflies); i) *Dictyophorus spumans* (Koppie Foam Grasshopper) and j) *Pycna sylvia* (Cicada).



k) *Dromica alboclavata* (Tiger Beetle); l) *Leptotes pirithous pirithous* (Common Zebra Blue); m) *Coenyra rufiplaga* (Secucuni Shade fly); n) *Crocothemis erythraea* (Broad Scarlet) and o) *Alphocoris indutus* (Shield-Backed Bug).

**INVERTEBRATE SPECIES OUTCOME**

SPECIES NAME	POC	STATUS	SPECIES NAME	POC	STATUS
<i>Pycna sylvia</i> (Cicada)	Confirmed	Localised Endemic	<i>Taurhina splendens</i> (Regal Fruit Chafer)	T	Medium
<i>Hadogenes polytrichobothrius</i> (Flat Rock Scorpion)	Confirmed	P (TOPS)	<i>Opisthophthalmus glabrifrons</i> (Burrowing Scorpion)	P (TOPS)	Confirmed
<i>Dromica alboclavata</i> (Tiger Beetle)	Confirmed	P (TOPS)	<i>Ceratogyrus sp</i> (Horned Baboon Spider)	P (TOPS)	High

**SCREENING TOOL VERIFICATION**

**Animal Species Theme**

Screening Tool Sensitivity	Verified Sensitivity
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Not indicated

High recommended



**b. VERIFICATION STATEMENT**

Based on the high-level *ground-truthed* results, including available desktop data and previous studies done in the area, **Figure 27** and **Figure 28** depict the sensitivity of each identified habitat unit for both the flora and fauna, respectively. The areas are awarded a sensitivity in terms of the presence or potential for SCC, habitat integrity and levels of disturbance, threat status of the habitat type, and the presence of unique landscapes.

For the floral assessment, the data gathered during the site visit indicate that the Degraded Habitat is of Low and Moderately Low Sensitivity, the Open Bushveld of Moderately-High Sensitivity, and the Freshwater Habitat, Mountain Bushveld and Montane Grassland habitat of High Sensitivity. For the faunal assessment, the data gathered during the site visit indicate that the Degraded Habitat is of Low and Moderately Low Sensitivity, the Open Bushveld and Montane Grassland habitat of Moderately-High Sensitivity, and the Freshwater Habitat and Mountain Bushveld of High Sensitivity.

In terms of the Screening Tool outcomes, the combined terrestrial biodiversity theme was confirmed high for most of the habitat units, excluding only the Degraded Habitat Unit. The medium sensitivity for the plant species theme was confirmed for all but the Degraded Habitat Unit; however, for some of the habitat units a high is recommended due to the confirmed presence of SCC (refer to Section 4.1). The animal species theme outcome was confirmed high for three SCC (two avifaunal and one mammal). A further 16 SCC (eight avifaunal, seven mammal and one reptile) SCC were indicated as medium sensitivity, of which thirteen species were confirmed as either medium or high POC post site assessment. Three species (two mammal and one avifaunal) which were indicated as medium sensitivity by the screening tool have been reduced to a low POC within the application area following the site assessment.

**Table 33** provides the summary of the Screening Tool outcome and the field-verified results for each of the terrestrial biodiversity themes.

Table 33: Summary of desktop and site verification

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY
<b>ANIMAL SPECIES THEME</b>		
<b>MAMMALS</b>		
High	High	Terrestrial Animal Species Specialist Assessment Report
Medium	Medium (high recommended)	Terrestrial Animal Species Specialist Assessment Report
<b>AVIFAUNA</b>		
High	High	Terrestrial Animal Species Specialist Assessment Report
Medium	Medium (high recommended)	Terrestrial Animal Species Specialist Assessment Report
<b>REPTILES</b>		
Medium	Medium (high recommended)	Terrestrial Animal Species Specialist Assessment Report
<b>AMPHIBIANS</b>		



SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY
Not indicated	High recommended	Terrestrial Animal Species Specialist Assessment Report
INVERTEBRATES		
Not indicated	High recommended	Terrestrial Animal Species Specialist Assessment Report
<b>PLANT SPECIES THEME</b>		
DEGRADED HABITAT		
Medium	Low	Compliance Statement
FRESHWATER HABITAT		
Medium	Medium (high recommended for EEDLs)	Terrestrial Plant Species Specialist Assessment Report
MONTANE GRASSLAND HABITAT		
Medium	Medium (high recommended)	Terrestrial Plant Species Specialist Assessment Report
SEKHUKHUNE MOUNTAIN BUSHVELD HABITAT		
Medium	Medium (high recommended)	Terrestrial Plant Species Specialist Assessment Report
<b>TERRESTRIAL BIODIVERSITY THEME</b>		
DEGRADED HABITAT		
High	Low	Compliance Statement
FRESHWATER HABITAT		
High	High	Terrestrial Biodiversity Specialist Assessment
MONTANE GRASSLAND HABITAT		
High	High	Terrestrial Biodiversity Specialist Assessment
SEKHUKHUNE MOUNTAIN BUSHVELD HABITAT		
High	High	Terrestrial Biodiversity Specialist Assessment

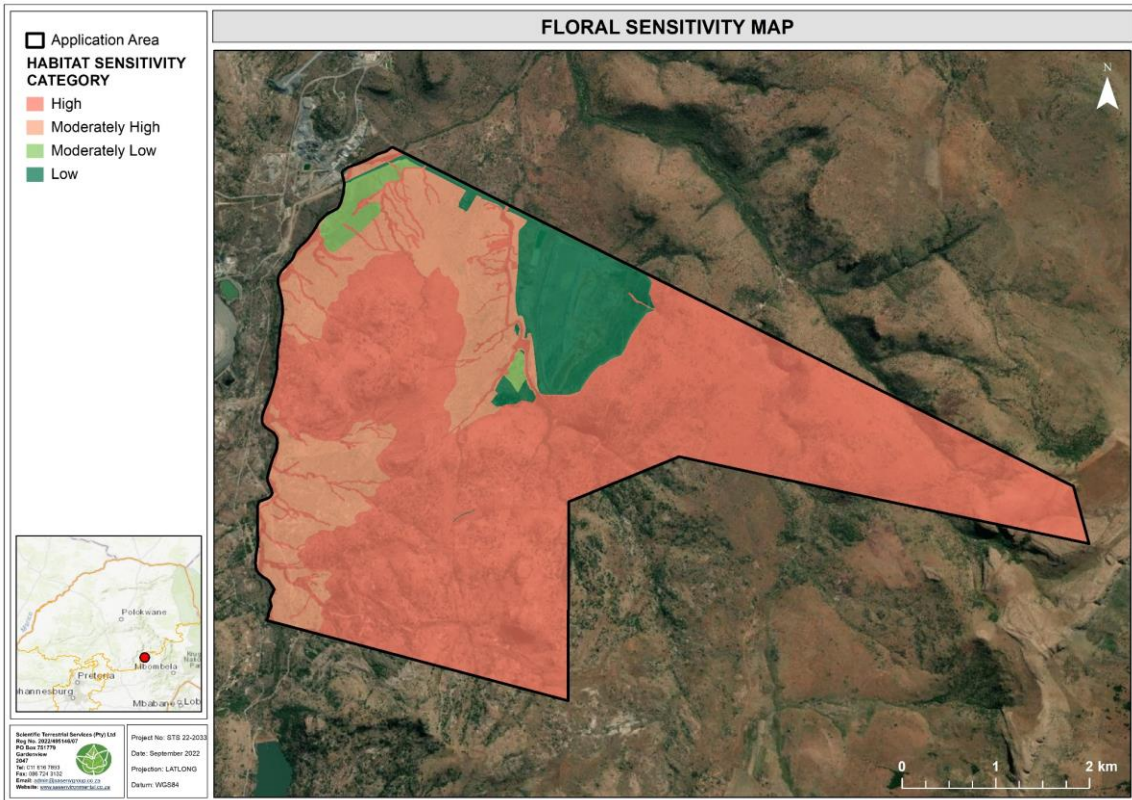


Figure 27: Floral sensitivity for the application area

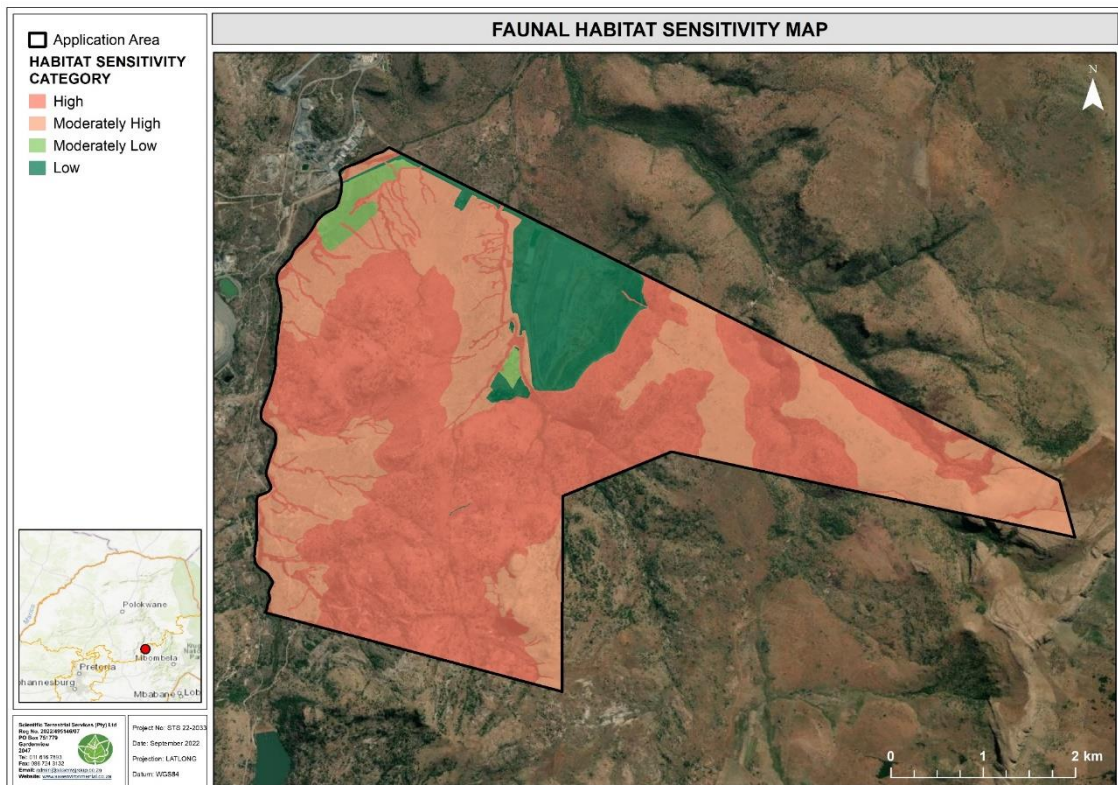


Figure 28: Faunal sensitivity for the application area



c. IMPACT STATEMENT

The prospecting right, as being applied for would entail non-invasive prospecting activities in the study area, thus no significant physical activities are proposed to be undertaken.

d. REASONED OPINION FOR ISSUING THE EA

The proposed non-invasive prospecting, consisting of a detailed desktop assessment and research of historical prospecting data, is not anticipated to have any significant impacts on the receiving environment. However, if it is decided that additional borehole drilling is required as part of prospecting activities, impacts to the receiving environment will take place. In such an event, it is recommended that specialist terrestrial biodiversity assessments be undertaken during the summer months for areas where prospecting (and associated prospecting roads) will be within habitat identified as sensitive (i.e., where the medium and high screening tool outcomes have been verified). If prospecting will take place in areas where a low sensitivity for the screening tool was recommended, a compliance statement will suffice.

It should be noted that this terrestrial assessment (including floral and faunal aspects) was undertaken at a high-level to ascertain potential risks and constraints. Due to the low quantum of risk presented by the proposed non-invasive prospecting, a detailed terrestrial assessment was not deemed necessary at this stage. As such, the data presented in this report should not be used for any other purpose than it is intended for.

## V. AQUATIC BIODIVERSITY

Scientific Aquatic Services (SAS) was appointed by Environmental Management Assistance (Pty) Ltd on behalf of Nomamix (Pty) Ltd to conduct a baseline Aquatic Biodiversity assessment and the required desktop and site verification.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.4 – Aquatic Biodiversity Assessment**.



a. SUMMARY OF DESKTOP ASSESSMENT

**Table 34** provides a summary of the background information that was used to aid in defining the presence of any freshwater ecosystems prior to the site verification.

Table 34: Desktop data relating to the characteristics of the freshwater ecosystem/features associated with the study and investigation area

AQUATIC ECOREGION AND SUB-REGIONS IN WHICH THE MAREESBURG PROSPECTING RIGHT AREA IS LOCATED			DETAIL OF THE MAREESBURG PROSPECTING RIGHT AREA IN TERMS OF THE NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREA (NFEPA) (2011) DATABASE (Figure 30)	
Ecoregion	Eastern Bankenveld		FEPACODE: Freshwater Ecosystem Priority Area (FEPA)	The Maresburg prospecting right area falls within an area defined as a <b>CODE 1 FEPA catchment</b> . FEPA catchments achieve biodiversity targets for river ecosystems and 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. Although the FEPA status applies to the actual river reach, the surrounding land and smaller stream network needs to be managed in a way that maintains the good condition of the river reach.
Catchment	Olifants North			
Quaternary Catchment	B41G			
WMA	Olifants			
Sub-Water Management Area (SubWMA)	Steelpoort			
DOMINANT CHARACTERISTICS OF THE EASTERN BANKENVELD LEVEL II (KLEYNHANS ET AL., 2007A)				
Ecoregion Level II (Figure 29)	9.02	9.03	NFEPA Wetlands and Rivers (Figure 31)	No wetlands are indicated by the NFEPA database within the Maresburg prospecting right area, nor within the investigation area. The Groot-Dwars River and the Maresburg Spruit traverse the Maresburg prospecting right area and investigation area. The Groot-Dwars River is considered natural (Class A/B). The Maresburg Spruit is considered largely natural (Class B). Both rivers are designated FEPA Rivers and therefore, in terms of the NFEPA Implementation Manual (2011), mining (and/or prospecting) is not considered a compatible land use within 1km (1000 m) of a riverine buffer around a river FEPA.
Dominant primary terrain morphology	Closed hills, Mountains; Moderate and high relief, low mountains			
Dominant primary vegetation types	Mixed Bushveld, Patches of Afromontane Forest and North Eastern Mountain Grassland	Mixed Bushveld		
Altitude (m a.m.s.l)	700 to 1700	500 to 2300		
MAP (mm)	400 to 1000	400 to 700		
Coefficient of Variation (% of MAP)	<20 to 34	20 to 34	Wetland vegetation Type (Figure 33)	The majority of the Maresburg prospecting right area falls within the <b>Central Bushveld Group 1</b> Wetland Vegetation Type considered <b>critically endangered</b> (Mbona <i>et al</i> , 2015), while the remaining south-eastern portion of the Maresburg prospecting right area falls within the <b>Mesic Highveld Grassland Group 7 and Group 6</b> Wetland Vegetation Type considered <b>endangered</b> and <b>least threatened</b> respectively.
Rainfall concentration index	55 to >65	55 to 64		
Rainfall seasonality	Early to mid-summer	Early summer		
Mean annual temp. (°C)	10 to 22	14 to 22		
Winter temperature (July)	0 to 22	2 to 20 °C		





Summer temperature (Feb)		8 to 30	12 – 30 °C	<p><b>DETAIL OF THE MAREESBURG PROSPECTING RIGHT AREA IN TERMS OF THE LIMPOPO CONSERVATION PLAN VERSION 2 (2018) (Figure 32)</b></p>	
Median annual simulated runoff (mm)		20 to 150; 200 to >250	20 to 150		
<p><b>ECOLOGICAL STATUS OF THE MOST PROXIMAL SUB-QUATERNARY REACH (DWS, 2014) (Figure 35)</b></p>					
Sub-quaternary reach	B41G – 00674 (Groot Dwars River)	B41G – 00721 (Groot Dwars River)	B41G – 00726 (Mareesburg Spruit)	<p>Critical Biodiversity Area (CBA) 2</p> <p>The Mareesburg prospecting right area falls within an area defined as a <b>Category 2 CBA</b>. These are <b>Best Design Selected Sites</b> that are selected to meet biodiversity pattern and / or ecological processes targets. Alternative sites may be available to meet targets.</p> <p><u>Land Management Recommendations:</u> Implement appropriate zoning and land management guidelines to avoid impacting on ecological processes. Avoid intensification of land use and fragmentation of natural landscapes.</p> <p><u>Incompatible Land-Use:</u> Urban land-uses including Residential (including golf estates, rural residential, resorts), Business, Mining &amp; Industrial; Infrastructure (roads, power lines, pipelines). <b>Note:</b> <i>Certain elements of these activities could be allowed subject to detailed impact assessment to ensure that developments were designed to maintain the overall ecological functioning of ESAs.</i></p>	
Assessed by expert?	Yes	Yes	Yes		
PES Category Median	<b>Class D (Largely Modified)</b>	<b>Class C (Moderately Modified)</b>	<b>Class B (Largely Natural)</b>		
Stream Order	2	1	1		
Mean Ecological Importance (EI) Class	<b>High</b>	<b>High</b>	<b>High</b>		
Mean Ecological Sensitivity (ES) Class	<b>Very High</b>	<b>Very High</b>	<b>Very High</b>		
Default Ecological Class (based on median PES and highest EI or ES mean)	Class A (Very High)	Class A (Very High)	Class A (Very High)		
<p><b>NATIONAL BIODIVERSITY ASSESSMENT (2018): SOUTH AFRICAN INVENTORY OF INLAND AQUATIC ECOSYSTEMS (SAIIAE) (Figure 31)</b></p>					
<p>Several dams were identified within the investigation area and one dam is located within the Mareesburg prospecting right area according to the NBA (2018): SAIIAE artificial features Database. The Groot Dwars River is classed as Class D largely modified, and Mareesburg Spruit as largely natural (Class C) according to the NBA 2018 Dataset. The Ecosystem Protection Level (EPL) of both rivers are poorly protected and therefore the rivers are critically endangered (Ecosystem Threat Status (ETS)). There are no natural wetland features identified by the NBA Dataset to be in the Mareesburg prospecting right area or the investigation area.</p>					
<p><b>IMPORTANCE OF THE MAREESBURG PROSPECTING RIGHT AREA ACCORDING TO THE MINING AND BIODIVERSITY GUIDELINES (2013)</b></p>					
<p>The Mareesburg prospecting right area falls within an area considered of <b>Highest Biodiversity Importance</b>. Highest Biodiversity Importance areas include areas where mining is not legally prohibited, but where there is a very high risk that due to their potential biodiversity significance and importance to ecosystem services (e.g., water flow regulation and water provisioning) that mining projects will be significantly constrained or may not receive the necessary authorisations.</p>					
<p><b>NATIONAL WEB-BASED SCREENING TOOL (FIGURE 3)</b></p>					



<p>The screening tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the EA process. this assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas.</p>	<b>STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (SWSA) (2017)</b>	
<p>For the aquatic biodiversity theme, the Mareesburg prospecting right area is considered to have an overall <b>aquatic sensitivity of very high</b>, due to the area being classified as a FEPA catchment (NFEPA, 2011).</p>	<p>Surface water WSAs are defined as areas of land that supply a disproportionate (i.e., relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.</p>	
	<p>Name and Criteria</p>	<p>The Mareesburg prospecting right area does not fall within a SWSA.</p>
<b>LANDTYPE DATA (Figure 34)</b>		
<p>A number of landtypes are located across the study area; the central and south-western parts of the study area are characterised by the <b>Ib31</b> landtype. A small part of the south-eastern part of the study area is underlain by the <b>Ib147</b> landtype. Ib landtype groupings are areas where 60-80% of the surface is occupied by exposed rock and stones/boulders and the slopes are usually steep. The rest of the area comprises mostly shallow soils, directly underlain by hard or weathered rock.</p> <p>The Dwars River that forms the western boundary of the study area, and the river's valley is comprised of the <b>Dc31</b> landtype. Dc Landtypes are characterised by soils with strong structural properties such as prismatic, pedocutanic, vertic, melanic and red structured soils. This is true of the Groot Dwars valley floor which is predominated by vertic topsoils and subsoils and soil forms with a pedocutanic characteristics in the subsoil, with no hydromorphic characteristics.</p> <p>Parts of the eastern component of the study area are occupied by the <b>Ab29</b> landtype. Ab landtypes are characterised by the presence of red-yellow apedal, freely drained soils. These soils are normally associated with high rainfall areas, where soils are subjected to moderate (i.e. mesotrophic) to intense (i.e. dystrophic) leaching of nutrients from the soil profile. The Ab29 landtype is characterised by a mix of the Hutton soil form (characterised by red apedal sub-soils). Where Hutton soil forms do not occur, the remainder (including all valley floors in this landtype) are comprised of highly structured clay soils including melanic and vertic topsoils and pedocutanic sub-soils.</p> <p>The far eastern part of the study area is comprised of the <b>Fa 327</b> and <b>Fa343</b> landtypes. Fa landtype groupings are characterised by generally shallow soils consisting of a topsoil directly underlain by weathered rock (the Glenrosa Soil Form) or hard rock (the Mispah form), sometimes with surface rock and steep slopes. Soils in the Fa landtypes in the study area are generally characterised by structured clay soils displaying pedocutanic and Neocutanic sub-soils, especially within the lowest-lying parts of the terrain in this part of the study area.</p> <p>The landtype data indicates very little soil forms / families which are characterised by hydromorphic characteristics, thus limited wetland occurrence is expected based on a landtype analysis for the study area.</p>		

**CBA = Critical Biodiversity Area; DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; EPL = Ecosystem Protection Level; ESA = Ecological Support Area; ETS = Ecosystem Threat Status; m.a.m.s.l = Metres Above Mean Sea Level; MAP = Mean Annual Precipitation; NBA = National Biodiversity Assessment; NFEPA = National Freshwater Ecosystem Priority Areas; PES = Present Ecological State; SAIIE = South African Inventory of Inland Aquatic Ecosystems; WMA = Water Management Area.**

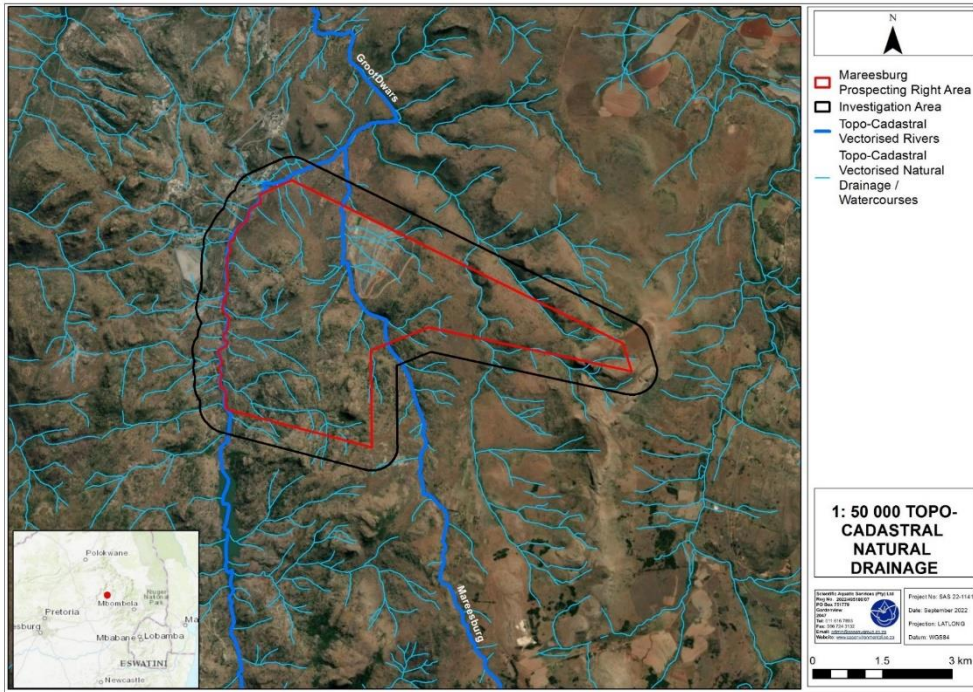


Figure 29: Map of natural surface water drainage in the study and investigation area, as presented on the 1:50 000-scale topo-cadastral map for the area

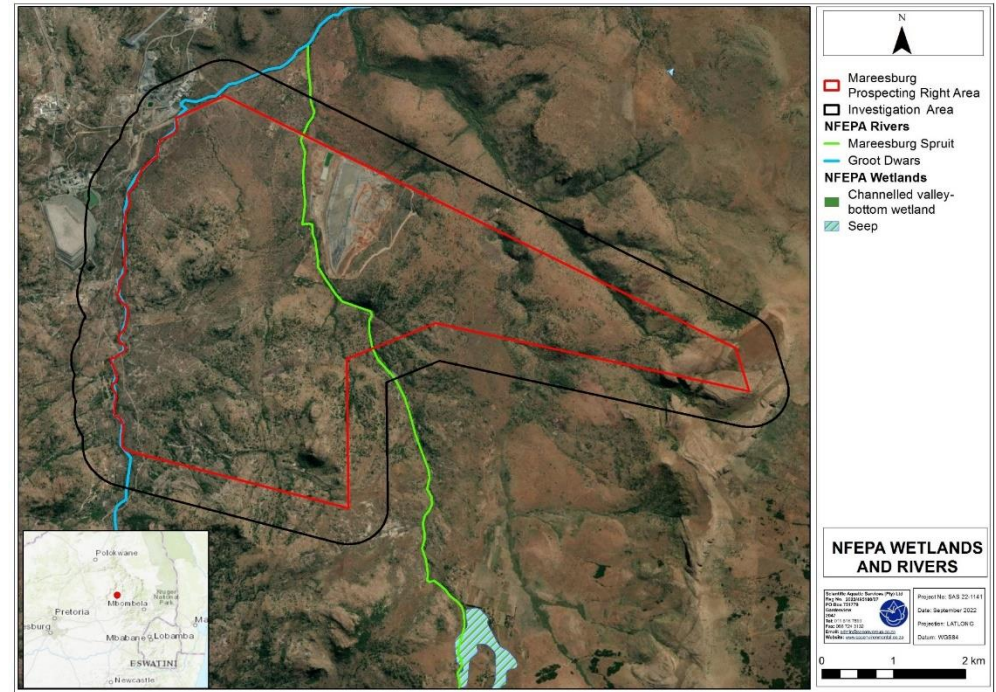


Figure 30: Wetlands and Rivers within the investigation area indicated by the NFEPA database

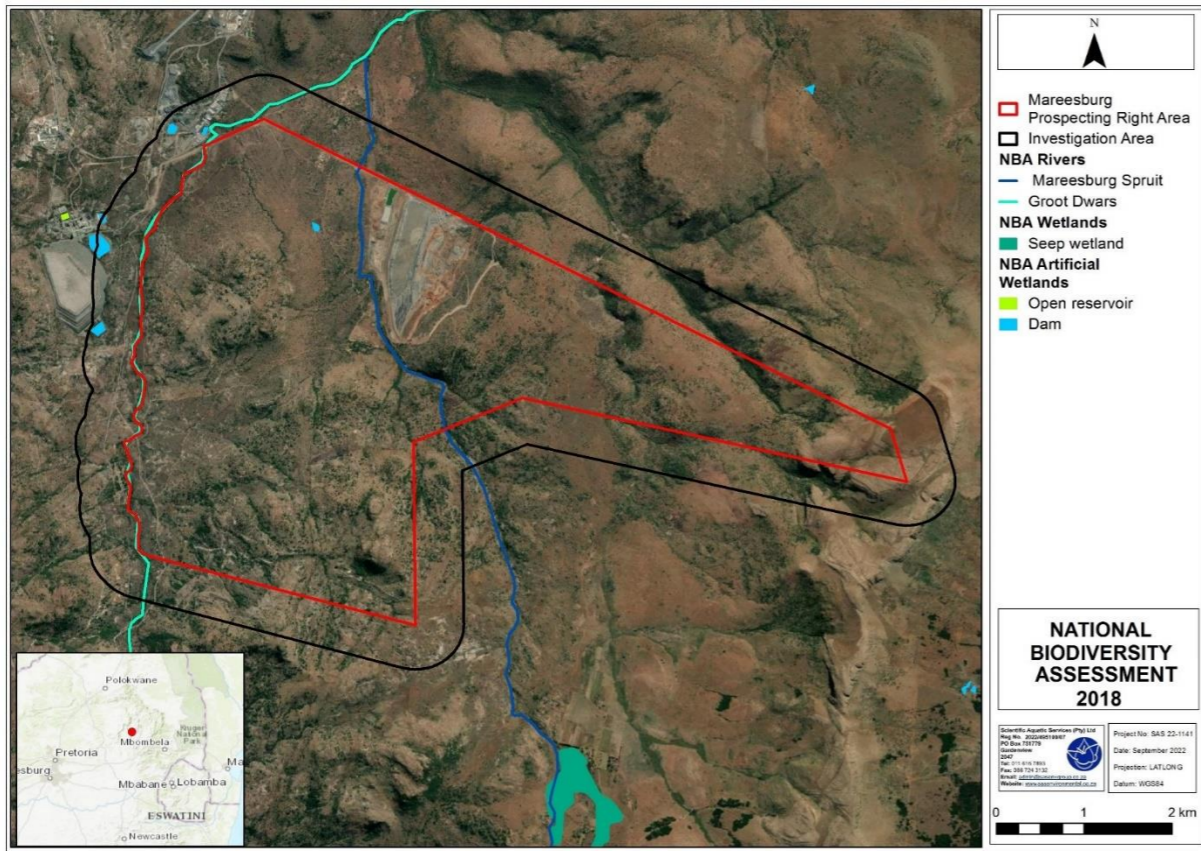


Figure 31: Wetlands and Rivers within the investigation area indicated by the National Biodiversity Assessment, 2018

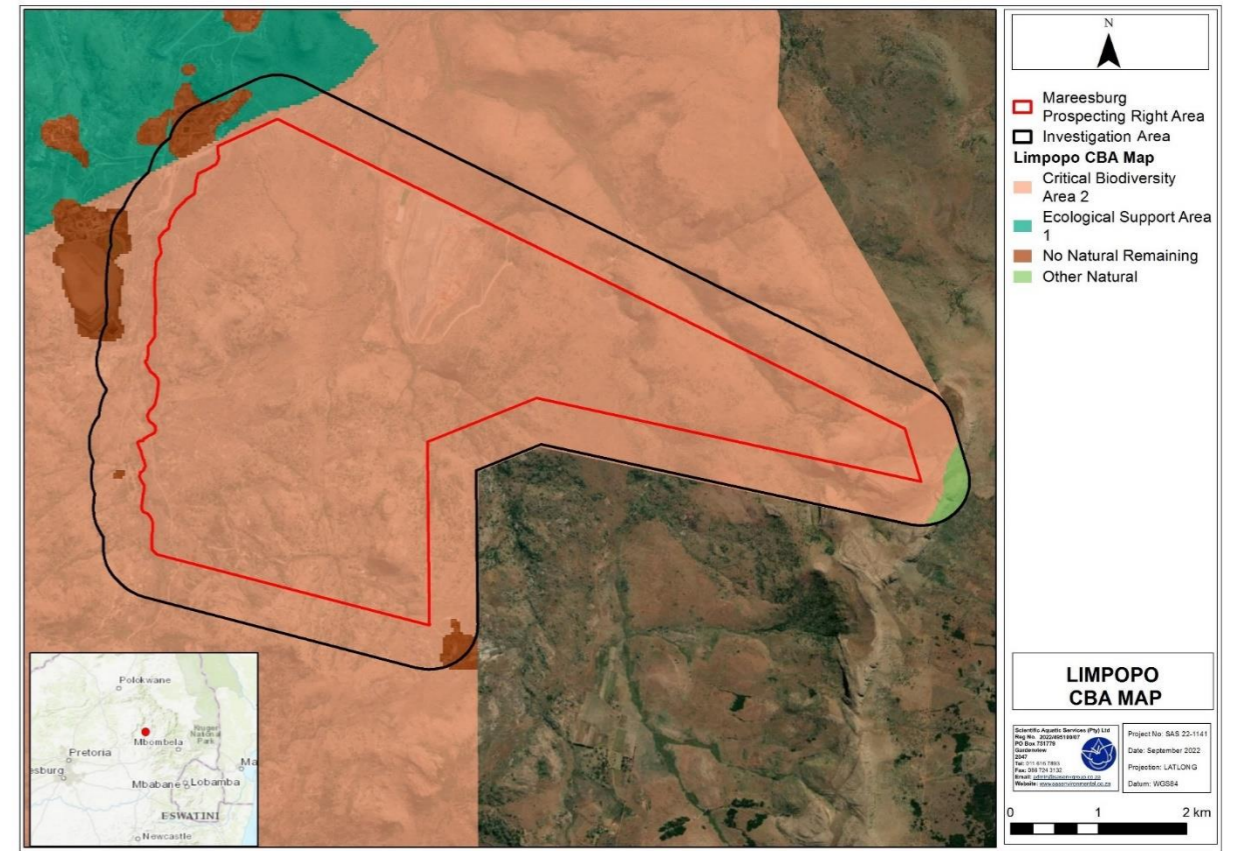


Figure 32: Designations in the study areas according to the Limpopo Conservation Plan 2018 (Waterberg Bioregional Plan)

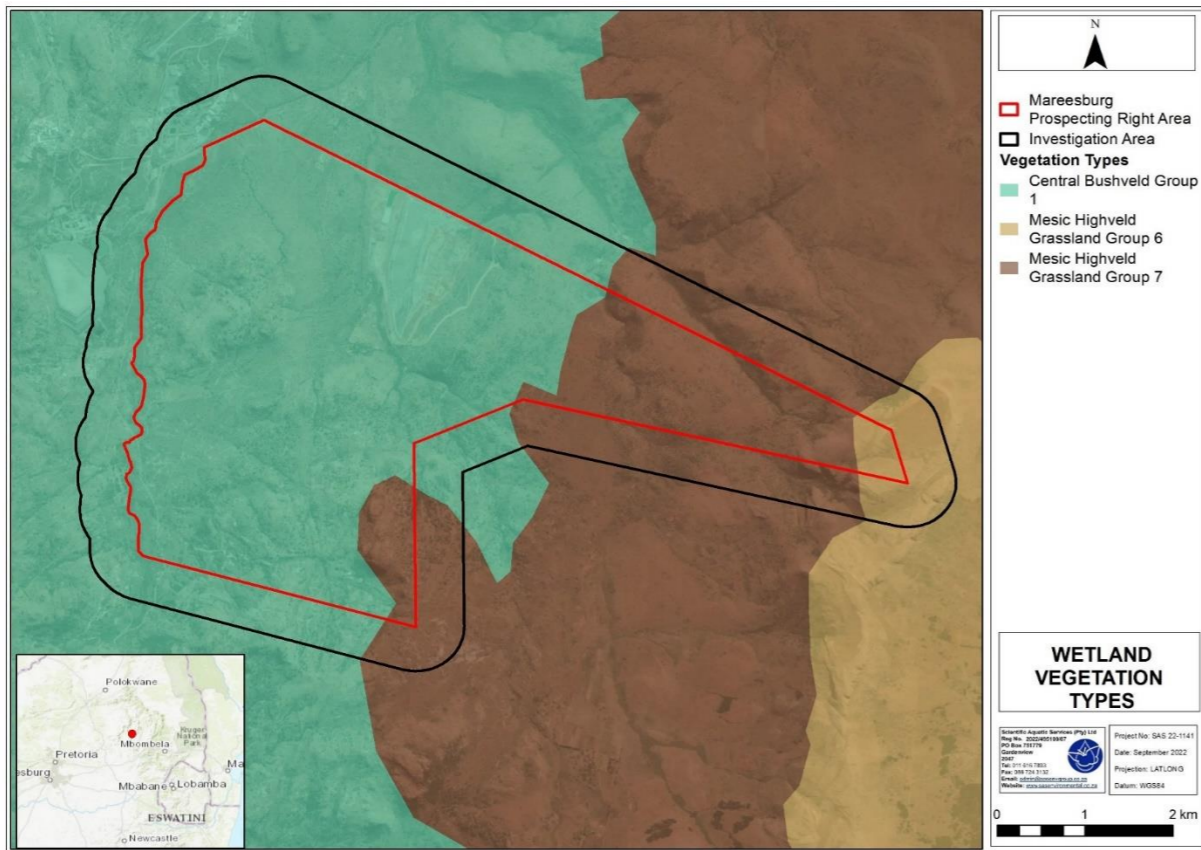


Figure 33: Wetland Vegetation Types in the Study and Investigation Areas

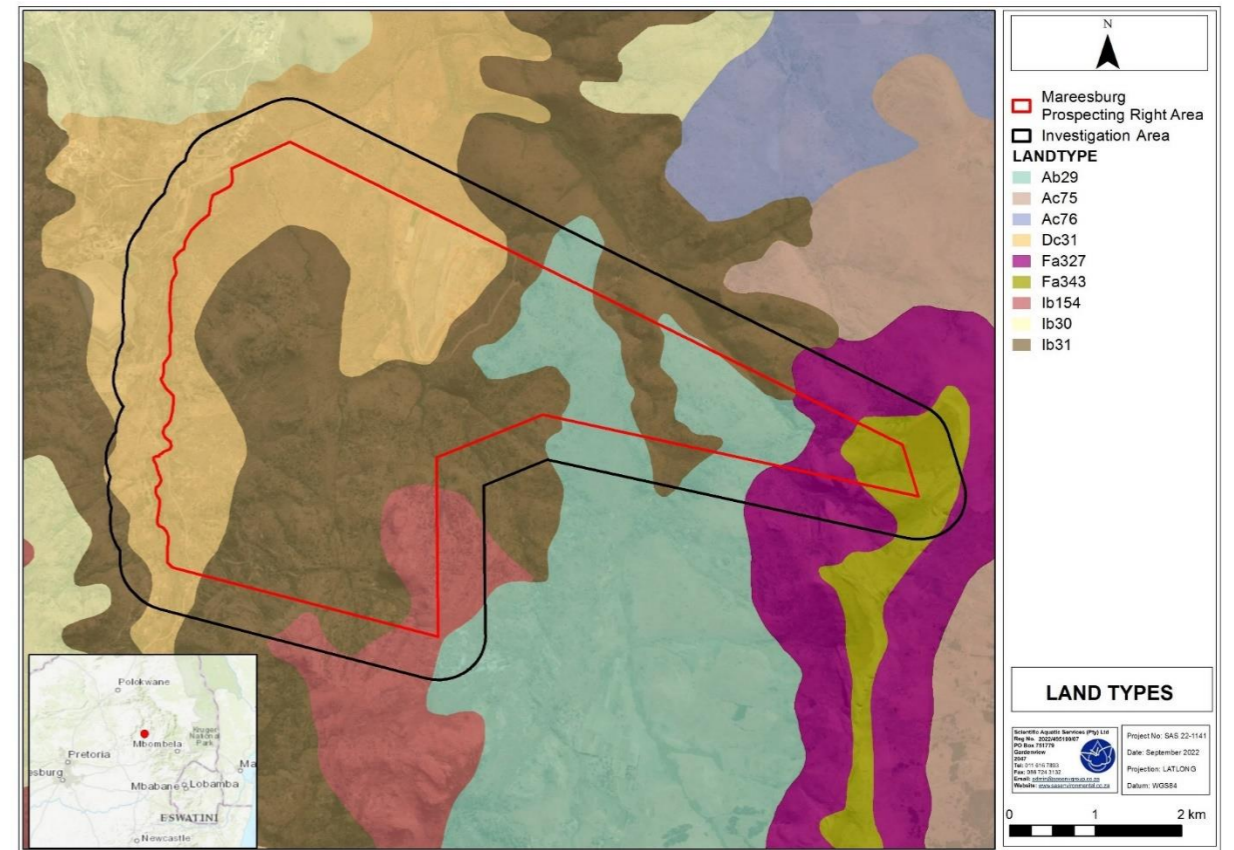


Figure 34: Land types within the study and investigation area

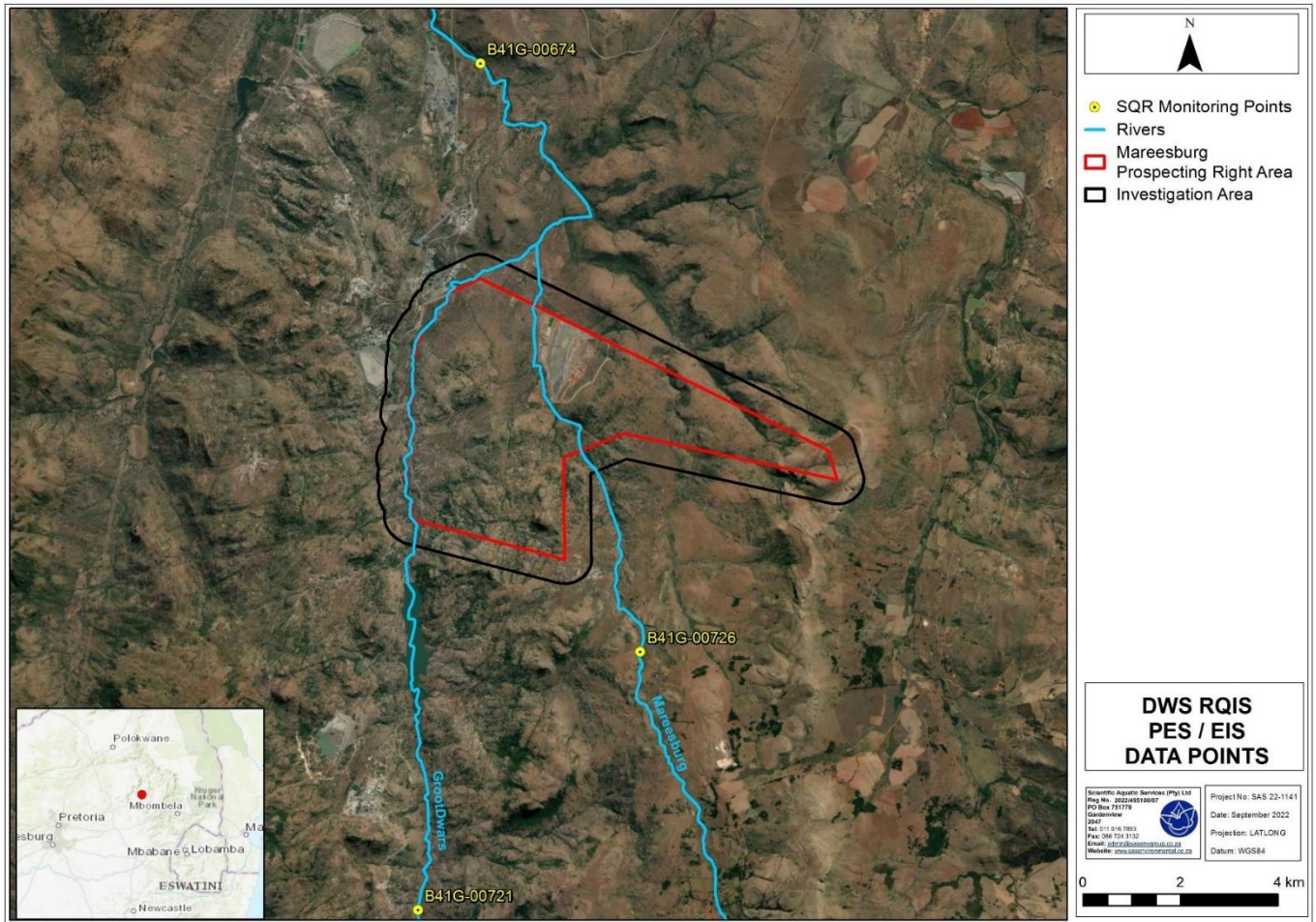


Figure 35: DWS RQIS PES/EIS Data Points

The reaches of the Groot Dwars River and the Mareesburg Spruit that traverse the Mareesburg prospecting right area fall within the Western Bankenveld Aquatic Ecoregion and within the B41G quaternary catchment. According to the PES/EIS database as developed by the DWS RQIS Department, the following sub-quaternary catchment reach (SQR) for the Groot Dwars and Mareesburg Spruit is applicable with the SQR monitoring points located approximately 4 km north (B41G-00674), 2 km south east (B41G-00726), and 6.8 km south (B41G-00721) of the study area.

Table 35 to Table 37 provides the macro-invertebrate taxa has previously been reported from SQR B41G-00726, B41G-00674 and B41G-00721 (Groot Dwars River and Mareesburg Spruit).

Table 35: Fish species previously collected from or expected in the various SQR monitoring points associated with SQR B41G-00726, B41G-00674, and B41G-00721 (Groot Dwars River and Mareesburg Spruit)

FISH SPECIES	B41G - 00726 – MAREESBURGSPRUIT	B41G – 00674 (GROOT DWARS RIVER)	B41G – 00721 (GROOT DWARS RIVER)
<i>Amphilius uranoscopus</i>	✓	✓	✓
<i>Chiloglanis pretoriae</i>	✓	✓	✓
<i>Clarias gariepinus</i>	✓	✓	✓
<i>Enteromius motebensis</i>	✓		✓
<i>Enteromius neefi</i>	✓	✓	✓



FISH SPECIES	B41G - 00726 – MAREESBURGSPRUIT	B41G – 00674 (GROOT DWARS RIVER)	B41G – 00721 (GROOT DWARS RIVER)
<i>Enteromius trimaculatus</i>	✓	✓	
<i>Enteromius unitaeniatus</i>	✓	✓	
<i>Labeo cylindricus</i>	✓	✓	
<i>Labeo molybdinus</i>		✓	
<i>Labeobarbus marequensis</i>	✓	✓	✓
<i>Oreochromis mossambicus</i>		✓	
<i>Pseudocrenilabrus philander</i>	✓	✓	✓
<i>Tilapia sparrmanii</i>	✓	✓	✓

Table 36: Invertebrates previously collected from or expected at the SQR B41G-00726, B41G-00674 and B41G-00721 (Groot Dwars River and Mareesburg Spruit)

INVERTEBRATE SPECIES	B41G - 00726 – MAREESBURGSPRUIT	B41G – 00674 (GROOT DWARS RIVER)	B41G – 00721 (GROOT DWARS RIVER)
Aeshnidae	✓		✓
Ancyliidae	✓	✓	
Athericidae	✓	✓	✓
Baetidae > 2 sp.	✓	✓	✓
Belostomatidae	✓	✓	✓
Caenidae	✓	✓	✓
Ceratopogonidae	✓	✓	✓
Chironomidae	✓	✓	✓
Chlorocyphidae		✓	✓
Coenagrionidae	✓	✓	✓
Corduliidae	✓		
Corixidae	✓	✓	✓
Crambidae (pyralidae)	✓		
Culicidae	✓	✓	✓
Dixidae	✓		✓
Dytiscidae	✓	✓	✓
Ecnomidae	✓		
Elmidae/dryopidae	✓	✓	✓
Gerridae	✓	✓	✓
Gomphidae	✓	✓	✓
Gyrinidae	✓	✓	✓
Helodidae	✓		
Heptageniidae	✓	✓	✓
Hirudinea	✓		✓
Hydracarina	✓	✓	✓
Hydraenidae	✓	✓	
Hydrometridae	✓	✓	✓
Hydrophilidae	✓		✓
Hydropsychidae	✓ > 2 sp.	✓ 2 sp.	✓ 2 sp.
Hydroptilidae	✓	✓	
Lepidostomatidae	✓		
Leptophlebiidae		✓	✓
Leptoceridae	✓	✓	✓
Libellulidae	✓	✓	✓
Lymnaeidae			✓
Muscidae	✓		✓
Naucoridaenepidae	✓	✓	✓
Notonectidae	✓	✓	✓



INVERTEBRATE SPECIES	B41G - 00726 – MAREESBURGSPRUIT	B41G – 00674 (GROOT DWARS RIVER)	B41G – 00721 (GROOT DWARS RIVER)
Oligochaeta	✓	✓	✓
Perlidae		✓	
Philopotamidae	✓	✓	✓
Physidae			✓
Planorbinae		✓	✓
Pleidae	✓	✓	✓
Potamonautidae	✓	✓	✓
Psephenidae	✓	✓	✓
Psychodidae			✓
Simuliidae	✓	✓	✓
Tabanidae	✓	✓	✓
Thiaridae			✓
Tipulidae	✓	✓	✓
Tricorythidae	✓	✓	✓
Turbellaria	✓	✓	✓
Veliidae/mesoveliidae	✓	✓	✓

Table 37: Summary of the ecological status of the sub-quaternary catchment (SQ) reaches associated with the freshwater ecosystems in proximity of the Mareesburg prospecting right area based on the DWS RQS PES/EIS database

ECOLOGICAL STATUS	B41G-00726 (MAREESBURGSPRUIT)	B41G-00674 (GROOT DWARS)	B41G-00721 (GROOT DWARS)
<b>Synopsis</b>			
<b>PES Category Median</b>	Largely Natural (Class B)	Largely Modified (Class D)	Moderately Modified (Class C)
<b>Mean EI<sup>19</sup> class</b>	High	High	High
<b>Mean ES<sup>20</sup> class</b>	Very High	Very High	Very High
<b>Length</b>	18.71	11,84	32,04
<b>Stream order</b>	1	2	1
<b>Default EC<sup>21</sup></b>	Very High (Class A)	Very High (Class A)	Very High (Class A)
<b>PES<sup>22</sup> Details</b>			
<b>Instream habitat continuity MOD<sup>23</sup></b>	Small	Moderate	Large
<b>RIP/wetland zone continuity MOD</b>	Small	Moderate	Small
<b>Potential instream habitat MOD activities</b>	Moderate	Large	Moderate
<b>Riparian/wetland zone MOD</b>	Small	Moderate	Small
<b>Potential flow MOD activities</b>	Moderate	Large	Moderate
<b>Potential physico-chemical MOD activities</b>	Small	Large	Moderate
<b>EI Details</b>			
<b>Fish spp/SQ</b>	7.00	12.00	8,00
<b>Fish average confidence</b>	4.71	5.00	3,75
<b>Fish representivity per secondary class</b>	Low	Moderate	Low
<b>Fish rarity per secondary class</b>	Moderate	High	Moderate
<b>Invertebrate taxa/SQ</b>	51.00	41.00	48.00

<sup>19</sup> EI = Ecological Importance

<sup>20</sup> ES = Ecological Sensitivity

<sup>21</sup> EC = Ecological Category; default based on median PES and highest of EI or ES means

<sup>22</sup> PES = Present Ecological State; confirmed in database that assessments were performed by expert assessors

<sup>23</sup> MOD = Modification



ECOLOGICAL STATUS	B41G-00726 (MAREESBURGSPRUIT)	B41G-00674 (GROOT DWARS)	B41G-00721 (GROOT DWARS)
Invertebrate average confidence	3.94	4.17	3.92
Invertebrate representivity per secondary class	Very High	High	Very High
Invertebrate rarity per secondary class	Very High	High	Very High
EI importance: riparian-wetland-instream vertebrates (excluding fish) rating	High	Very High	Low
Habitat diversity class	High	Moderate	Very High
Habitat size (length) class	Low	Low	High
Instream migration link class	Very High	High	Moderate
Riparian-wetland zone migration link	Very High	High	Moderate
Riparian-wetland zone habitat integrity class	Very High	High	Moderate
Instream habitat integrity class	High	Moderate	High
Riparian-wetland natural vegetation rating based on percentage natural vegetation in 500m	Very High	Very High	Very High
Riparian-wetland natural vegetation rating based on expert rating	Low	Low	Low
<b>ES Details</b>			
Fish physical-chemical sensitivity description	Very High	Very High	Very High
Fish no-flow sensitivity	Very High	Very High	Very High
Invertebrates physical-chemical sensitivity description	Very High	Very High	Very High
Invertebrates velocity sensitivity	Very High	Very High	Very High
Riparian-wetland-instream vertebrates (excluding fish) intolerance water level/flow changes description	High	Very High	High
Stream size sensitivity to modified flow/water level changes description	Very High	High	Very High
Riparian-wetland vegetation intolerance to water level changes description	Low	Low	Low

*b. VERIFICATION OUTCOME*

A site investigation of the study area was undertaken from 29 to the 31 August 2022 during the winter season, using visual assessment methods. In addition, a 'bucket' soil auger was used to investigate soils in certain freshwater ecosystems for the presence of hydromorphy where vegetation species composition and structure suggested the presence of wetland habitat.

The site assessment confirmed that, as indicated in the topo-cadastral depiction of natural drainage in the wider area (**Figure 29**), there are various natural drainage features (freshwater ecosystems) which largely drain northwards into the Groot Dwars River that forms the western boundary of the study area.





*Figure: 36 A view west across the study area showing the hilly nature of the terrain that characterises much of the study area. Two episodic drainage lines are visible in the centre of the photograph*

The steep and hilly terrain in the southern and eastern parts of the study area (**Figure: 36**) strongly influences freshwater drainage in the study area. The northern and north-west parts of the site and the Groot Dwars River valley bottom are less hilly and more gently undulating. The predominant freshwater ecosystem hydrogeomorphic (HGM) type is the non-perennial (episodic) drainage line which tends to occur as very narrow, often steeply incised drainage features due to the hilly and incised nature of terrain over large parts of the study area. Only in the flatter parts of the site do freshwater ecosystems that are characterised by depositional processes occur.

The wider area in which the study and investigation areas fall is characterised by moderate to high volumes of rainfall (especially at higher altitudes which are located in the eastern-most extent of the study area), however the dominance of non-perennial drainage in the study area is strongly influenced by the nature of the substrate that characterises the study area. As detailed in the land type data for the study area (refer to Table 1), significant parts of the study area are characterised by exposed rock, or alternatively by very shallow soils which overlie a bedrock or weathered rock base. Where soils do occur, the nature of the underlying geology has resulted in the formation of strongly structured clay soils. The structure and very strong clayey nature of these soils is not conducive to the formation of interflow within the soils, and thus surface flow from precipitation is much more dominant than subsoil water movement (interflow). The predominance of surface flows as opposed to interflow and associated seepage is true for most of the first order drainage features in the study and investigation area which are characterised by a bedrock-dominated substrate (in certain cases with a complete absence of soil), and catchments that are comprised of rock and very shallow soils. These conditions are not conducive to the maintenance of seasonal / ephemeral flows and these upper sub-catchments are 'flashy' in their nature, with the drainage lines being characterised by flows only for short periods in response to rainfall events.

The drainage features apart from the Groot Dwars River (i.e. the Mareesburg Spruit and another unnamed tributary stream located to the east of the Mareesburg Spruit – see **Figure 37**) in the study area that were observed to be characterised by active flows during the site visit are characterised by larger catchments, and importantly in a hydrological context, are characterised by the presence of valley bottom and seep wetlands that are located within the flatter terrain of the Vygenhoek area that is located to the south of the study area. The wetlands in the upper catchments of these two perennial streams are critical for maintaining perennial surface flow within these streams.



*Figure 37 – Flow within the unnamed tributary stream of the Groot Dwars River in the eastern part of the study area*

The first order drainage lines are typically characterised by a narrow lateral extent, with some being characterised by the presence of riparian vegetation. In these settings the presence of woody vegetation along the drainage lines may be as much a product of the presence of rock outcropping along the drainage line which offers natural protection from fire as that of moisture availability, with moisture availability being reduced by the nature of runoff in the catchments of these episodic first order drainage lines as discussed above. In a fluvial geomorphic context, most of the first order drainage lines in the southern and eastern parts of the study area can be characterised as mountain headwater streams, which are usually first or second order, very steep-gradient drainage features dominated by vertical flow over bedrock with waterfalls and plunge pools. Reach types in mountain headwater streams include bedrock fall and cascades (Ollis et al, 2013).



Figure 38: An example of a higher order episodic drainage line that displays fluvial geomorphic characteristics of a mountain stream

Higher order drainage lines are however characterised by a more distinct woody riparian zone (e.g. **Figure 38**). In these higher order drainage lines a single macro channel is typically present and the channel bed is predominantly bedrock-dominated, with some localised areas of deposition of alluvial material where the local reach is flatter in terms of its longitudinal profile. These higher order drainage features can be geomorphologically classified as mountain streams (e.g. **Figure 38**) - steep-gradient streams dominated by bedrock and boulders, locally cobble or coarse gravels in pools, with reach types including cascades, bedrock fall, step-pools and plane beds (Ollis *et al*, 2013).

Within such flatter reaches of the higher order streams and drainage lines, certain reaches of the drainage line were noted to be vegetatively predominated by the presence of herbaceous hydrophytes (e.g. **Figure 37**) such as *Phragmites mauritanus*, *Miscanthus junceus*, *Arundinella nepalensis*, *Schoenoplectus spp.* and *Cyperus sexangularis*. Such reaches that can contain small areas of hydromorphic soils are typically limited by more rocky-dominated reaches upstream or downstream where no such sediment deposition is able to occur.

The largest fluvial feature in the study area is the Groot Dwars River which forms the western boundary of the study area. The Groot Dwars River is a perennial river, taking the form of an upper foothills stream<sup>24</sup> - a moderately steep, cobble-bed or mixed bedrock-cobble bed channel, with plane bed, pool-riffle or pool-rapid reach types (Ollis *et al*, 2013). The river is characterised by a mix of woody plants (with the most dominant species being *Combretum erythrophyllum*) and herbaceous species as detailed above in its riparian zone.

The lithological characteristics of the wider area also have an important bearing on the nature of freshwater ecosystem occurrence in the study area. Most of the site is underlain by igneous rocks of the Bushveld Complex – with the western and central part of the study area falling within the Rustenburg Layered Suite and being characterised by Pyroxenites, Norites, Anorthosites and,

<sup>24</sup> As defined by the NFEPA Rivers Database

Chromitites (western areas) and Bronzites, Harzburgites and Norites (central areas). The far eastern part of the site has a completely different geology and twinned with its higher altitude and resultant higher rainfall, has a slightly different freshwater ecosystem type assemblage. This area is characterised by quartzites of the Steenkampsberg Formation which form part of the Pretoria Group that falls within the Transvaal Supergroup.

In the area underlain by quartzites of the Steenkampsberg Formation, a seep wetland was encountered (**Figure 39**). The seep wetland occurs along a reach of a drainage line that drains a moderately sloping valley head in this part of the study area. The seep wetland is located on a localised area of slightly more level ground downgradient of a resistant band of quartzite that forms a waterfall, compared to the slopes upgradient and down gradient of the wetland, allowing the accumulation of inorganic and organic material within the wetland. The wetland has a convex cross-sectional profile, being characterised by two narrow channel-like flow paths on the outer parts of each side of the wetland.



*Figure 39: A view of the seep wetland in the far eastern part of the study area*

Soils in the wetland area characterised by the Didema soil form, which is characterised by an organic O topsoil horizon (a topsoil that is characterised by a high percentage of organic material) that is underlain by hard rock. The nature of the quartzite-derived substrate and higher rainfall in this part of the site as compared to the areas to the west entail that interflow is more prominent in this area and active seepage was noted to form active areas of lateral seepage that form part of this larger seep wetland (e.g. **Figure 40**).



Figure 40: An area of active lateral seepage within the wider seep wetland

The only other seep wetlands located in the study area are located in the northern part of the study area to the west of the Mareesburg Tailings Storage Facility (TSF) and upgradient of the Mareesburg Spruit (**Figure 41**). These seep wetlands are localised in extent and are likely to be areas of perched water tables where the water table is seasonally sufficiently shallow to allow the occurrence of hydrophytic wetland plant species such as hydrophytic forbs and graminoids. Such seepage areas were noted to be vegetatively dominated by the grass species *Imperata cylindrica* and *Miscanthus junceus* and the sedge *Cyperus sexangularis*.



Figure 41: A seep wetland in the northern part of the study area



The only other wetland in the study area is a channelled valley bottom wetland in the vicinity of the farmhouse in the northern part of the site.

Although a detailed assessment of freshwater state (PES) for the study area has not been undertaken as part of the scope of this assessment, observations relating to anthropogenic influences acting on the freshwater ecosystems in the study area were made during the field investigation.

Mining activity is the most significant impact to freshwater ecosystems in the study area, with the complete transformation of several historically occurring drainage lines having occurred with the establishment of the Mareesburg TSF and more recently other drainage lines having been transformed by clearing of areas on the western side of the Groot Dwars River valley associated with the development of a haul road. Where large scale land transformation has occurred on the site, adjacent freshwater ecosystems have likely also been impacted by the alteration of runoff from their catchments, that would have resulted in alteration to their hydrological and geomorphological state.

The water quality of the Dwars River is also adversely affected by mining activities in its catchment. Where mining activities have not occurred, especially in the central and eastern parts of the study area, there is a very low anthropogenic footprint with very limited livestock grazing occurring. Freshwater ecosystems in this part of the study area are subjected to very low, if any, impact related to the presence and proliferation of alien invasive vegetation.

The distribution and classification of freshwater features in the study area and associated investigation area is indicated in **Figure 42 to Figure 45**.

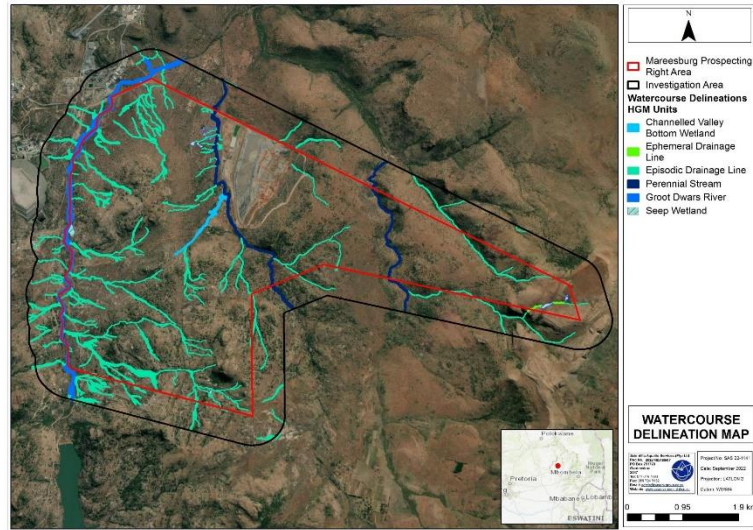


Figure 42: Freshwater ecosystems located within the study and investigation area

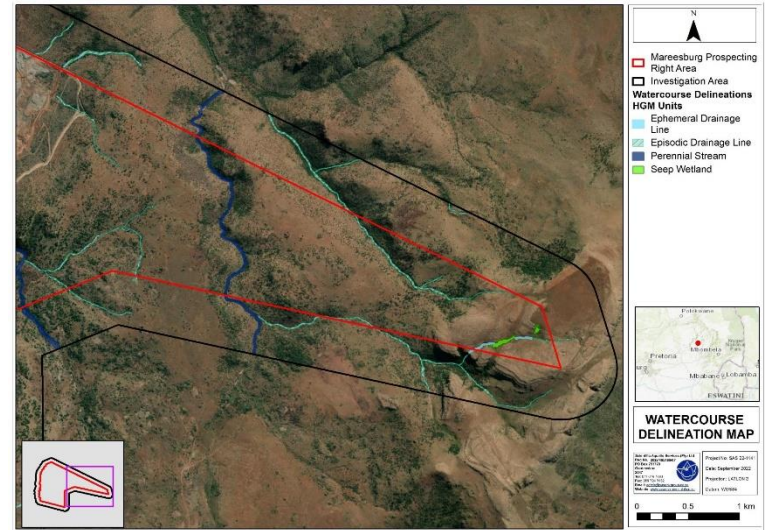


Figure 43: Freshwater ecosystems located within the eastern parts of the study and investigation area

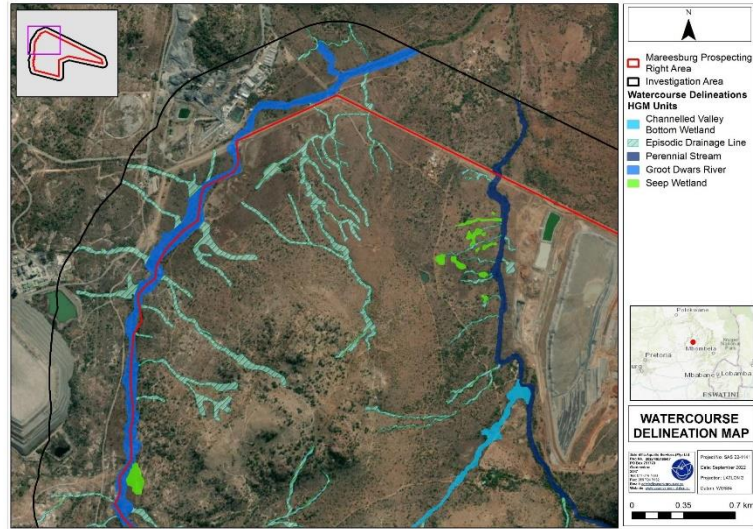


Figure 44: Freshwater features located within the northern parts of the study and investigation areas

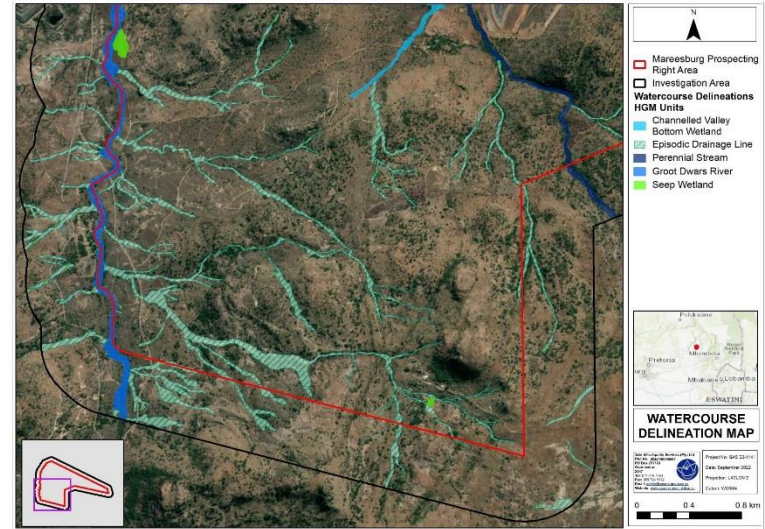


Figure 45: Freshwater features located within the southern parts of the study and investigation areas

Due to the non-invasive nature of the proposed prospecting, it will not trigger a Water Use Licence (WUL) in terms of Section 21 (c) and (i) of the National Water Act (NWA, Act No. 36 of 1998).

However if the nature of the prospecting changed to involve any physical activity, then these legislative triggers may become relevant along with the applicable zones of regulation and their associated environmental authorisations which would apply to the identified natural watercourses:

- A 32 m Zone of Regulation (ZoR), see **Figure 46 to Figure 48**, in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998), applying to all identified watercourses and wetlands; and
- A 100 m, and a 500m ZoR, see **Figure 49 to Figure 51**, in accordance with the National Water Act, 1998 (Act No. 36 of 1998) applying to all identified watercourses (with the 500m ZoR applying to all wetlands).

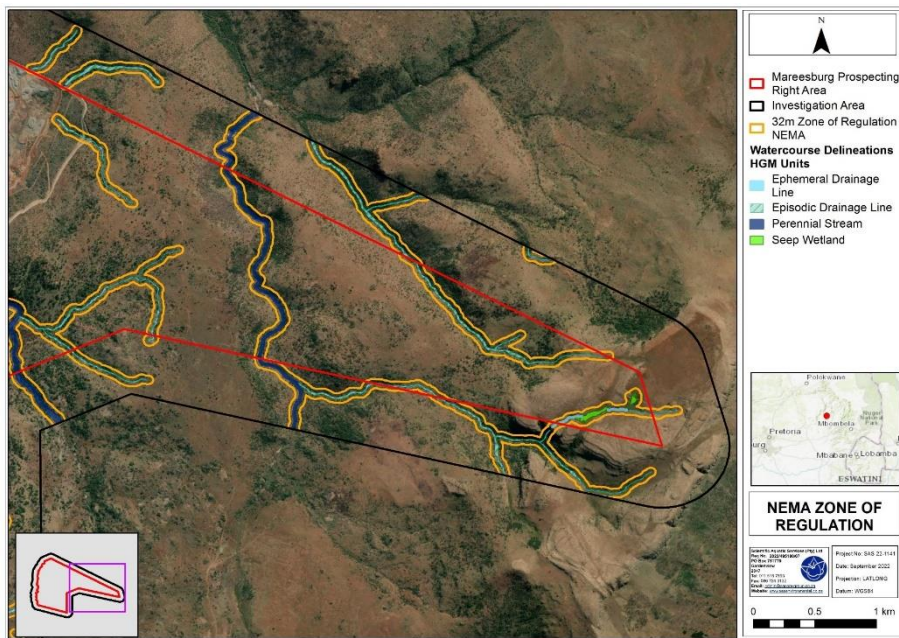


Figure 46: Potential regulated zones within the eastern parts of the study area (NEMA)

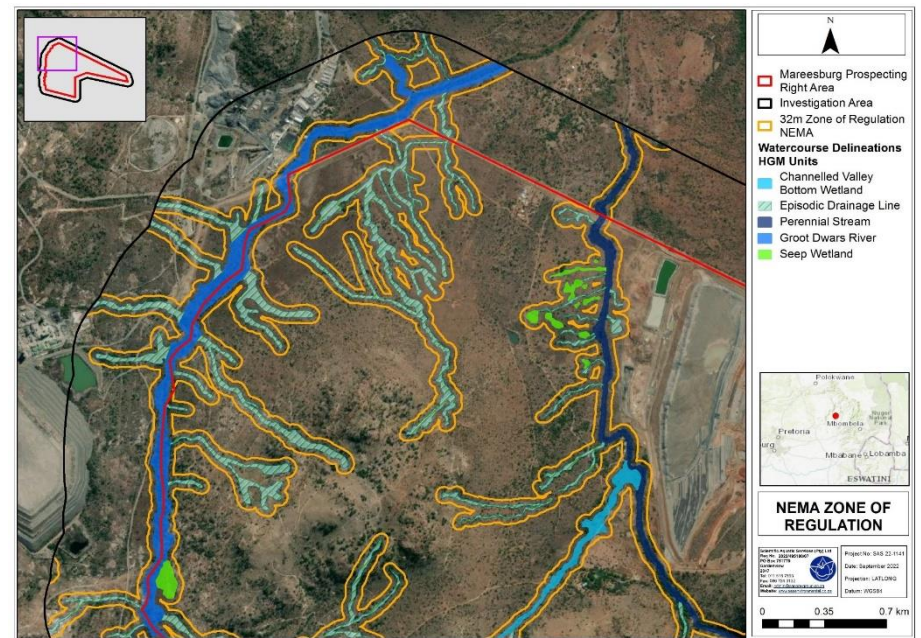


Figure 47: Potential regulated zones in the northern parts of the study area (NEMA)



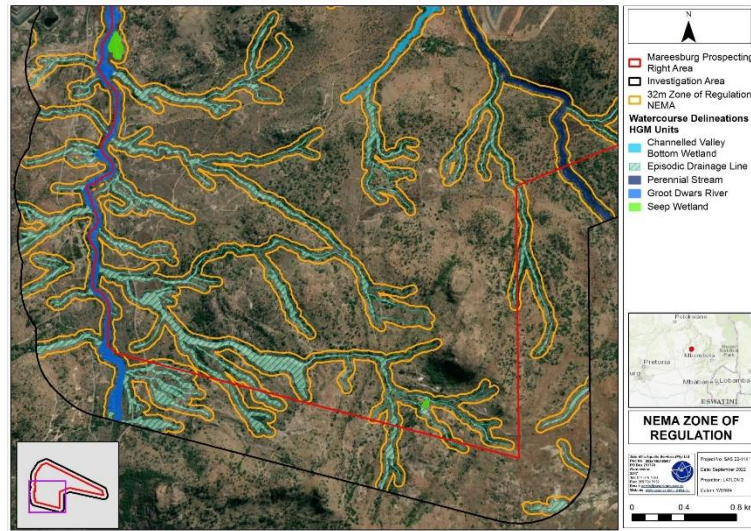


Figure 48: Potential regulated zones in the southern parts of the study and investigation areas (NEMA)

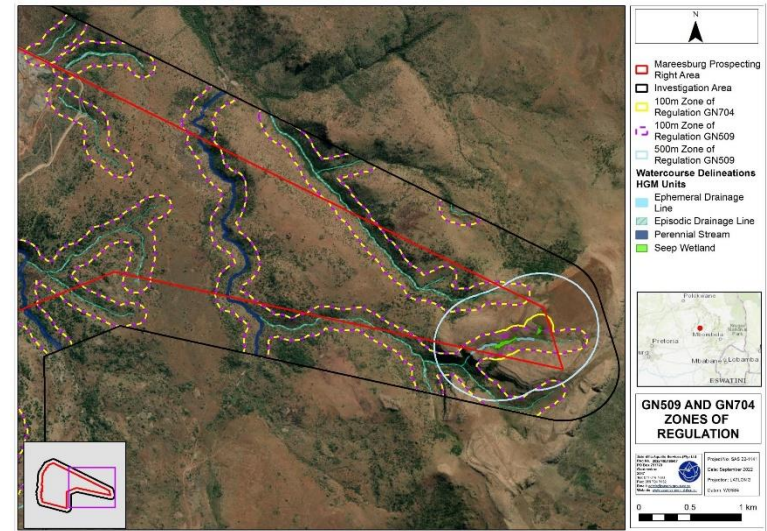


Figure 49: Potential regulated zones within the eastern parts of the study area (NWA)

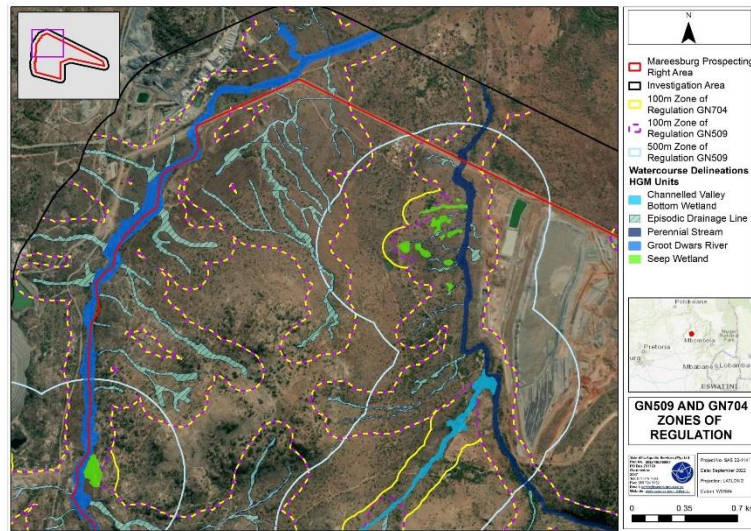


Figure 50: Potential regulated zones in the northern parts of the study area (NWA)

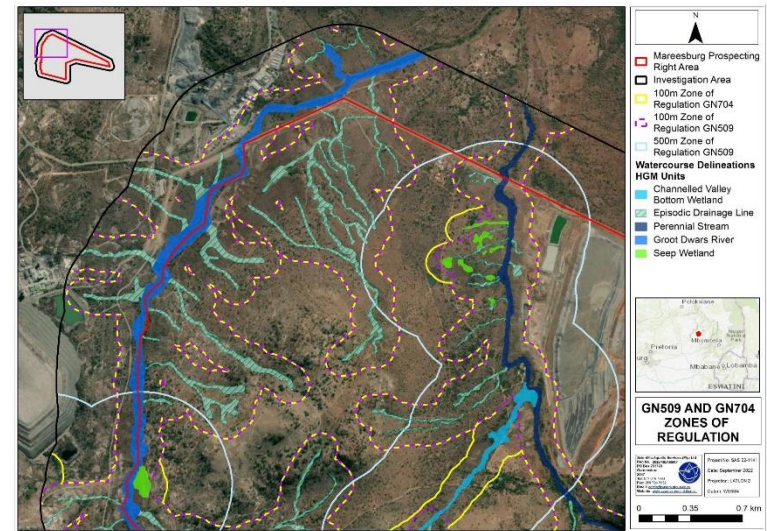


Figure 51: Potential regulated zones in the southern parts of the study and investigation areas (NWA)



c. VERIFICATION STATEMENT

Based on the site verification undertaken by Scientific Aquatic Services and the findings thereof presented in this report, numerous freshwater ecosystems were confirmed to occur in the study area associated with the application for (non-invasive) prospecting rights on the Farm Mareesburg 8 JT. The majority of these freshwater ecosystems are non-perennial episodic drainage lines in terms of their hydrology regime, but certain wetlands, streams and the Groot Dwars River are located within the study area.

The designation of very high sensitivity to wetland features in the study area by the DFFE Screening Tool has been supported through the findings of the freshwater assessment that has confirmed the very high sensitivity of all freshwater ecosystems in the study area.

Under the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity, (GN320 of March 2020), for areas of very high aquatic biodiversity sensitivity an Aquatic Biodiversity Assessment must be produced. However due the non-invasive nature of the proposed prospecting activity (i.e. comprising of no significant physical activities and thus no prospecting-related impacts on the freshwater features in the study area) the approach of producing such a compliance statement was

**Table 38** provides the summary of the verification outcome.

Table 38: Sensitivity verification summary following the freshwater assessment

SCREENING TOOL ASSIGNED SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT / PLAN OF STUDY
<b>Very High</b>	All wetlands and watercourses on the site have a <b>very high</b> aquatic biodiversity sensitivity	Due to the low risk posed by the proposed prospecting rights application-related activities, an aquatic compliance statement is considered adequate for the application for EA.  It recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken <b>should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities.</b>

d. IMPACT STATEMENT

The prospecting right, as being applied for would entail non-invasive prospecting activities in the study area, thus no significant physical activities are proposed to be undertaken. Accordingly, no impacts to the freshwater environment or freshwater ecosystems in the study area are envisioned and the risk profile to the freshwater environment is considered low to negligible. The freshwater ecosystems in the study area have been confirmed to be of very high aquatic biodiversity / freshwater sensitivity. Should the prospecting activities, as proposed, remain non-invasive (with no physical activity on the site), the prospecting activities will not result in an impact (new or cumulative) on the freshwater ecosystems in the study area and the prospecting right in its current form is associated with a low risk to the freshwater environment in the study area. The risk profile would change if any physical activities on the site were introduced.



e. REASONED OPINION FOR ISSUING THE EA

Due to the non-invasive nature of the proposed prospecting on the site (i.e. no associated physical activities and use of previous data), no significant impact on the freshwater environment in the site is anticipated. As such it is the professional opinion of the freshwater specialist that the prospecting right application be granted Environmental Authorisation, subject to prospecting remaining non-invasive with no associated physical activities in the study area. Due to the very high sensitivity associated with the freshwater ecosystems in the study area, it is recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities. Such an Aquatic Biodiversity Specialist Assessment must also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation.

## VI. HYDROLOGICAL (FLOOD LINE DETERMINATION)

GCS Water and Environmental Consultants (Pty) Ltd was appointed by EMA on behalf of Nomamix (Pty) Ltd to conduct a desktop flood line assessment.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.5 – Hydrological Flood line Determination**.

a. SITE OVERVIEW AND HYDROLOGY

As mentioned previously, the site is situated in Quaternary Catchment B41G of the Olifants Water Management Area (DWS, 2016). Elevations for the project area typically range from 768 to 1500 meters above mean sea level (mamsl).

In terms of the greater hydrological area, the prospecting right area is drained by the Groot-Dwars River (western boundary of the prospecting area) and a perennial tributary of the Groot-Dwars River (middle portion of the prospecting right area). The eastern portion of the prospecting area is drained via a non-perennial tributary of the **Groot-Dwars River**. Towards the south of the site, and in the Groot-Dwars River the Der Brochen Dam is found. The dam consists of an earth-fill embankment, stand-alone intake and a side-channel spillway. The dam has a maximum height of 30.5 m and is classified as large (DWAf, 2011). The dam was constructed to withstand a designed flow of 886 m<sup>3</sup>/sec (RMF was calculated at 715 m<sup>3</sup>/s and SEF 1 000 m<sup>3</sup>/s) (DWAf, 2011). Drainage from the Dwars River is towards the Steelpoort River, situated approximately 15km downstream of the site.

### **Sub-catchment/hydrological response units (HRU)**

Four (4) hydrological response units (HRUs) describe the natural drainage for the study area (using a 1:10 000 stream count and 30m DTM fill) – refer to **Figure 52** and **Figure 53**. The sub-catchment relates well to major desktop delineated drainage lines for the project area and describes the primary drainage towards the Groot-Dwars River.

Drainage within the demarcated prospecting right area is from higher laying areas towards lower laying areas via several ephemeral (non-perennial) streams with the end receptors being the Groot-Dwars River, a tributary of the Groot-Dwars River and

a non-perennial stream associated with the Groot-Dwars River (refer to **Figure 52**). Primary drainage is towards the north via the aforementioned rivers and streams.

Surface water drainage for the Mototolo Mine TSF facility appears to have changed and would need to be confirmed if the prospecting phase is changed to invasive.

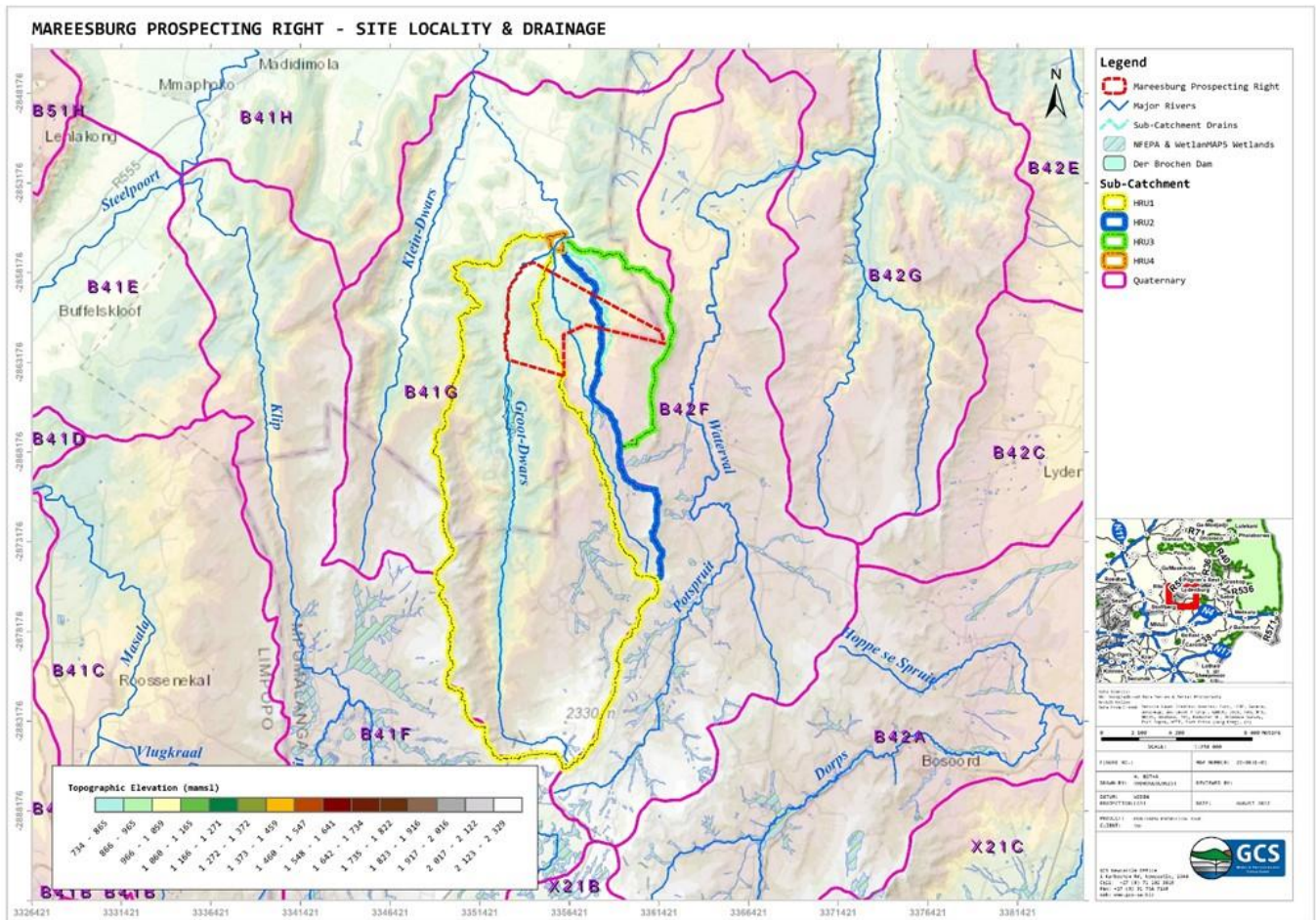


Figure 52: Site locality and drainage

**Land cover and slope rise**

Open woodland, natural grassland, dense forest & woodland and several other land types occur in the project area (DEA, 2019) – refer to **Figure 53**. The land cover was simplified into 4 categories and is summarised in **Table 39**. Slope % rise for the general area is shown in **Figure 54**. Slope rise % was used to characterise the sub-catchment slope and runoff generation.

In the modelling process of the flood lines or stormwater runoff (whichever applies to this study), Manning’s coefficient (n-values) values were set to represent natural stream systems and were supplemented by Google Earth imagery. These “n” values were further derived from the available vegetation and land cover data for the site.

Table 39: Summary of sub-catchments characteristics

SUB-CATCHMENT		HRU1	HRU2	HRU3	HRU4
Area (km <sup>2</sup> )		181.756	31.355	28.993	0.54
Longest Drainage Line (km)		25.10	13.21	8.41	0.84
Average Slope (%)		1.28%	4.71%	5.82	0.77%
Slope (%)	<3	2.34%	1.78%	1.72%	5.52%
	3-10	16.48%	30.75%	18.46%	53.99%
	10-30	40.19%	50.01%	43.96%	32.37%
	>30	40.99%	17.45%	35.86%	8.13%
Land Cover	Thick bush & plantation	9.33%	5.29%	5.36%	3.85%
	Light bush & farm-lands	38.88%	23.47%	31.81%	53.28%
	Grasslands	44.27%	60.75%	58.57%	42.39%
	No Vegetation	7.43%	10.14%	4.20%	0.14%

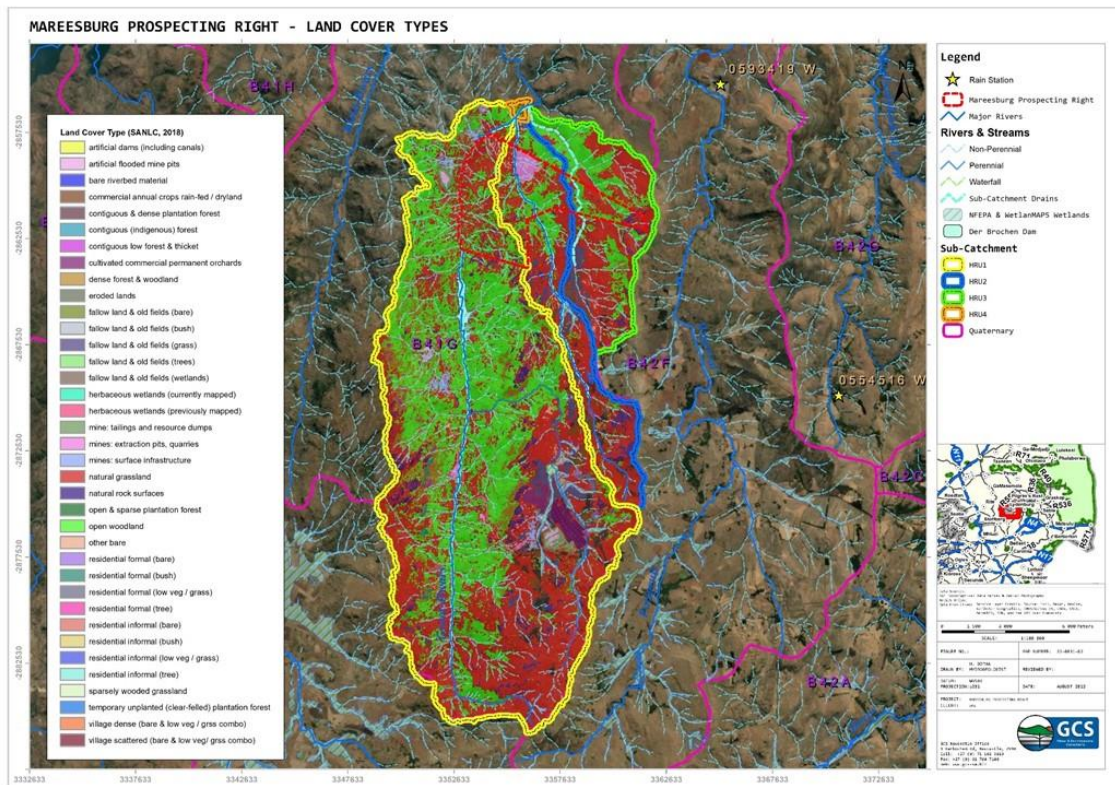


Figure 53: Sub-catchments & land cover of the proposed site

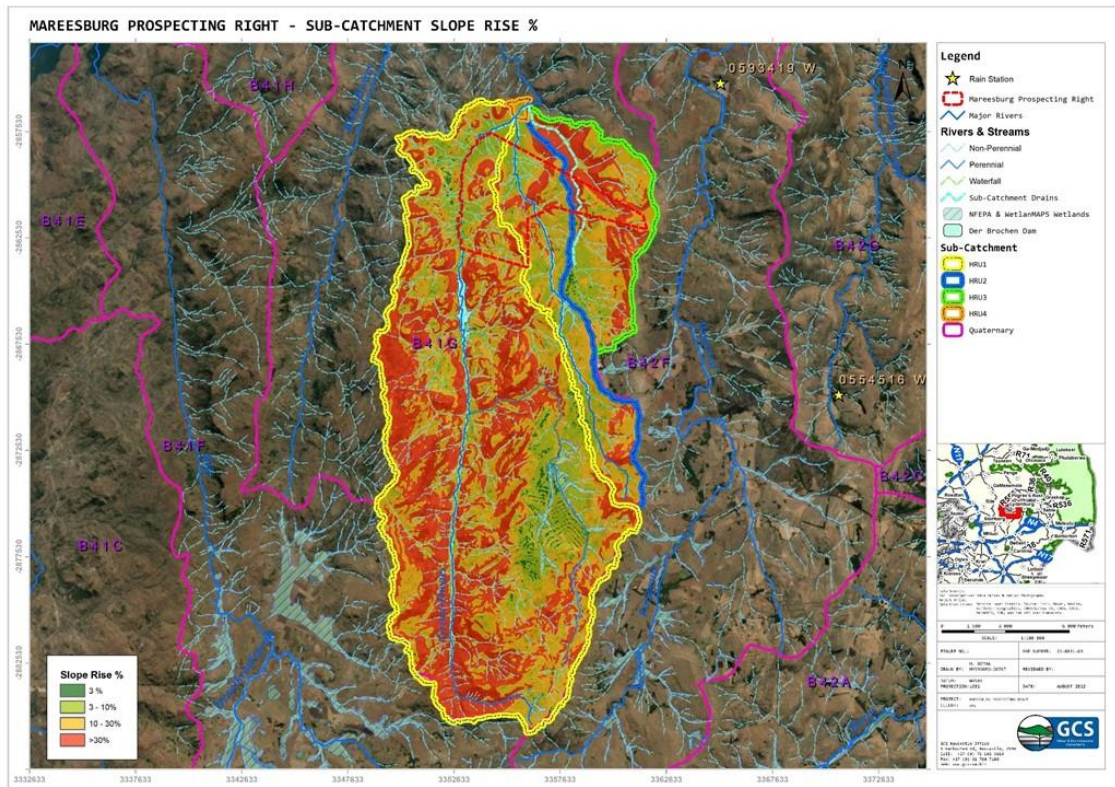


Figure 54: Sub-catchments and surface slope rise %

**Surface water and groundwater users in the study area**

According to Water Allocation Registration Management System (WARMS, 2019), there are ten (10) WARMS water users falling in the sub-catchments associated with the project, seven (7) downstream WARMS users, and according to SADAC GIP groundwater data for the area there are seventy-seven (77) groundwater users within a 10 km radius of the site (of which 6 fall in the sub-catchments associated with the project) – refer to **Figure 55**.

The Groot-Dwars River, Spekboom River, surface water dams and boreholes appear to be primary sources of water for inhabitants/mines in the project area. Total water used (combined groundwater and surface water) is in the order of 3.25 Mm<sup>3</sup>/yr for water users associated with the sub-catchments delineated for the projects, and 7.6 Mm<sup>3</sup>/yr for downstream relative to the project area.

The registry entry into WARMS for water use is summarised in **Table 40** and SADAC GIP boreholes are listed in **Error! Reference source not found.**

Table 40: Summary of WARMS users identified in HRU

ID	LATITUDE (WGS84)	LONGITUDE (WGS84)	USER	RESOURCE TYPE	RESOURCE	REGISTER STATUS	LAWFULNESS FINDING	REGISTERED VOLUME (M <sup>3</sup> /YR.)
24014870	-25.17000	30.16000	ME GROENEWALD	WETLAND	VLEI/ FOUNTAIN	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	5840



ID	LATITUDE (WGS84)	LONGITUDE (WGS84)	USER	RESOURCE TYPE	RESOURCE	REGISTER STATUS	LAWFULNESS FINDING	REGISTERED VOLUME (M <sup>3</sup> /YR.)
24072959	-25.03260	30.11766	RUSTENBURG PLATINUM MINES	BOREHOLE	GROUNDWATER	ACTIVE	LAWFUL	511000
24074154	-25.04111	30.11944	RUSTENBURG PLATINUM MINES CORPORATE	BOREHOLE	GROUNDWATER	CLOSED	LAWFULNESS STILL TO BE DETERMINED	37670
24079373	-25.09633	30.11511	ANGLO AMERICAN PLATINUM: DER BROCHEN PROJECT AND MOTOTOLO JOINT VENTURE	DAM	SURFACE WATER	ACTIVE	LAWFUL	1122913
24091705	-24.98897	30.12964	GLENCORE MERAFA VENTURE	LAKE	DE GROOTE BOOM PIT (OPEN CAST VOID)	ACTIVE	LAWFUL	936955
24096372	-25.01030	30.11053	RUSTENBURG PLATINUM MINES: DER BROCHEN	BOREHOLE	NORTHERN PIT	ACTIVE	LAWFUL	86436
24097380	-25.13333	30.10000	BOOYSENDAL PLATINUM	BOREHOLE	GROUNDWATER	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	57604.3
24102365	-25.05547	30.12069	SPITZKOP PLATINUM: MAREESBURG MINE	DAM	SURFACE WATER	ACTIVE	LAWFUL	96224
24102631	-25.09633	30.11511	BOOYSENDAL PLATINUM	SCHEME	NO DATA	ACTIVE	LAWFUL	346206
24102971	-25.06667	30.10000	NORTHAM PLATINUM	BOREHOLE	GROUNDWATER	ACTIVE	LAWFUL	59130
24053337	-24.95611	30.12861	GLENCORE MERAFA VENTURE	RIVER/STREAM	GREAT DWARS RIVER	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	307200
24053346	-24.91493	30.10901	DWARSRIEVER CHROME MINE	DAM	KLEIN DWARS RIVER (JOUNIE DAM)	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	1500000
24090788	-24.98333	30.16667	SPEKBOOM RIVER IRRIGATION BOARD	RIVER/STREAM	SPEKBOOM RIVER	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	5559900
24097460	-24.91639	30.11067	TWO RIVERS PLATINUM	BOREHOLE	GROUNDWATER	ACTIVE	LAWFULNESS STILL TO BE DETERMINED	9490



ID	LATITUDE (WGS84)	LONGITUDE (WGS84)	USER	RESOURCE TYPE	RESOURCE	REGISTER STATUS	LAWFULNESS FINDING	REGISTERED VOLUME (M <sup>3</sup> /YR.)
24100107	-24.95458	30.12347	XSTRATA THORNCLIFFE	BOREHOLE	GROUNDWATER	ACTIVE	LAWFUL	158045
24100116	-24.95458	30.12347	XSTRATA THORNCLIFFE	BOREHOLE	GROUNDWATER	ACTIVE	LAWFUL	109500
24102953	-24.93731	30.13578	DE GROOT BOOM MINERALS	BOREHOLE	GROUNDWATER	ACTIVE	LAWFUL	19760

Table 41: Groundwater users within a 10 km radius of the prospecting right area

ID	SOURCE	LATITUDE (WGS84) DECIMAL DEGREES	LONGITUDE (WGS84) DECIMAL DEGREES	ELEVATION (MAMSL)	WATER LEVEL (MBGL)
605898	SADAC GIP (2022)	-25.035	30.1201	1072	No Data
605899	SADAC GIP (2022)	-25.03	30.12	1062	No Data
605923	SADAC GIP (2022)	-25.03999	30.11961	1074	No Data
606095	SADAC GIP (2022)	-24.98436	30.08234	942	No Data
606096	SADAC GIP (2022)	-24.98249	30.08354	941	No Data
606097	SADAC GIP (2022)	-24.97902	30.0845	937	No Data
606151	SADAC GIP (2022)	-25.02573	30.12019	1061	No Data
609360	SADAC GIP (2022)	-24.98874	30.08092	945	No Data
609720	SADAC GIP (2022)	-24.926944	30.144167	1046	No Data
658594	SADAC GIP (2022)	-24.93397	30.09975	914	6.1
658609	SADAC GIP (2022)	-24.95064	30.19975	1369	6.1
658610	SADAC GIP (2022)	-24.95064	30.19976	1369	9.8
658611	SADAC GIP (2022)	-24.95065	30.19975	1369	4.6
658612	SADAC GIP (2022)	-24.95064	30.19977	1369	4.6
658613	SADAC GIP (2022)	-24.95066	30.19975	1369	No Data
658614	SADAC GIP (2022)	-24.95064	30.19978	1369	No Data
658615	SADAC GIP (2022)	-24.95067	30.19975	1369	No Data
658616	SADAC GIP (2022)	-24.95064	30.19979	1369	No Data
658632	SADAC GIP (2022)	-24.93397	30.14975	1044	8.8
658633	SADAC GIP (2022)	-24.93397	30.14976	1044	3.1





ID	SOURCE	LATITUDE (WGS84) DECIMAL DEGREES	LONGITUDE (WGS84) DECIMAL DEGREES	ELEVATION (MAMSL)	WATER LEVEL (MBGL)
658634	SADAC GIP (2022)	-24.97563	30.15419	1052	12
658635	SADAC GIP (2022)	-24.97564	30.15419	1052	24
658636	SADAC GIP (2022)	-24.97563	30.1542	1052	20
658637	SADAC GIP (2022)	-24.97565	30.15419	1052	24
658644	SADAC GIP (2022)	-24.94425	30.15197	1080	No Data
658645	SADAC GIP (2022)	-24.94426	30.15197	1080	No Data
658646	SADAC GIP (2022)	-24.96008	30.18891	1365	No Data
658647	SADAC GIP (2022)	-24.96009	30.18891	1365	No Data
658648	SADAC GIP (2022)	-24.96009	30.18892	1365	No Data
658649	SADAC GIP (2022)	-24.9601	30.18892	1365	No Data
658650	SADAC GIP (2022)	-24.9601	30.18893	1365	28
658652	SADAC GIP (2022)	-24.96175	30.24558	1298	No Data
658653	SADAC GIP (2022)	-24.9748	30.24419	1363	No Data
658654	SADAC GIP (2022)	-24.99924	30.17753	1463	No Data
658655	SADAC GIP (2022)	-24.98035	30.19419	1375	No Data
658656	SADAC GIP (2022)	-24.97147	30.19808	1364	No Data
658657	SADAC GIP (2022)	-24.95203	30.22031	1433	No Data
658658	SADAC GIP (2022)	-24.98646	30.15169	1029	No Data
658659	SADAC GIP (2022)	-24.98674	30.15031	1059	8.2
658660	SADAC GIP (2022)	-24.97841	30.19281	1380	No Data
658665	SADAC GIP (2022)	-24.9612	30.18753	1364	No Data
658666	SADAC GIP (2022)	-24.96119	30.18753	1364	No Data
658667	SADAC GIP (2022)	-24.96119	30.18752	1364	No Data
658670	SADAC GIP (2022)	-24.96091	30.18613	1358	No Data
658671	SADAC GIP (2022)	-24.93758	30.14308	1019	No Data
658672	SADAC GIP (2022)	-24.92897	30.14558	1069	No Data
658673	SADAC GIP (2022)	-24.93231	30.14142	1014	No Data
658674	SADAC GIP (2022)	-24.96091	30.18558	1358	No Data



ID	SOURCE	LATITUDE (WGS84) DECIMAL DEGREES	LONGITUDE (WGS84) DECIMAL DEGREES	ELEVATION (MAMSL)	WATER LEVEL (MBGL)
658675	SADAC GIP (2022)	-24.96092	30.18559	1358	No Data
658676	SADAC GIP (2022)	-24.96093	30.1856	1358	No Data
658677	SADAC GIP (2022)	-24.96093	30.18561	1358	No Data
658704	SADAC GIP (2022)	-24.96731	30.26643	1418	No Data
658705	SADAC GIP (2022)	-24.96731	30.26644	1418	6
680913	SADAC GIP (2022)	-25.0673	30.23308	1686	20.1
680914	SADAC GIP (2022)	-25.0673	30.23309	1686	No Data
680915	SADAC GIP (2022)	-25.06731	30.23308	1686	4.9
680916	SADAC GIP (2022)	-25.0673	30.2331	1686	No Data
680917	SADAC GIP (2022)	-25.06732	30.23308	1686	No Data
680918	SADAC GIP (2022)	-25.0673	30.23311	1686	No Data
680919	SADAC GIP (2022)	-25.06733	30.23308	1686	5.5
680920	SADAC GIP (2022)	-25.0673	30.23312	1686	16.8
680921	SADAC GIP (2022)	-25.06734	30.23308	1686	17.7
680933	SADAC GIP (2022)	-25.03396	30.23308	1526	No Data
680934	SADAC GIP (2022)	-25.03397	30.23308	1526	7
680935	SADAC GIP (2022)	-25.03396	30.23309	1526	14
680949	SADAC GIP (2022)	-25.03641	30.10669	1316	90
680950	SADAC GIP (2022)	-25.04369	30.09003	1367	128
680953	SADAC GIP (2022)	-25.0434	30.23586	1554	17
680954	SADAC GIP (2022)	-25.10896	30.06642	1932	No Data
680955	SADAC GIP (2022)	-25.06646	30.10781	1307	No Data
680956	SADAC GIP (2022)	-25.10063	30.26642	1739	9.1
680957	SADAC GIP (2022)	-25.10063	30.26643	1739	12.2
681062	SADAC GIP (2022)	-25.09054	30.27417	1595	17.1
681063	SADAC GIP (2022)	-25.09557	30.27321	1607	No Data
681064	SADAC GIP (2022)	-25.04709	30.28583	1468	5.7
681065	SADAC GIP (2022)	-25.07191	30.2856	1545	4



ID	SOURCE	LATITUDE (WGS84) DECIMAL DEGREES	LONGITUDE (WGS84) DECIMAL DEGREES	ELEVATION (MAMSL)	WATER LEVEL (MBGL)
681071	SADAC GIP (2022)	-25.05535	30.27642	1506	4

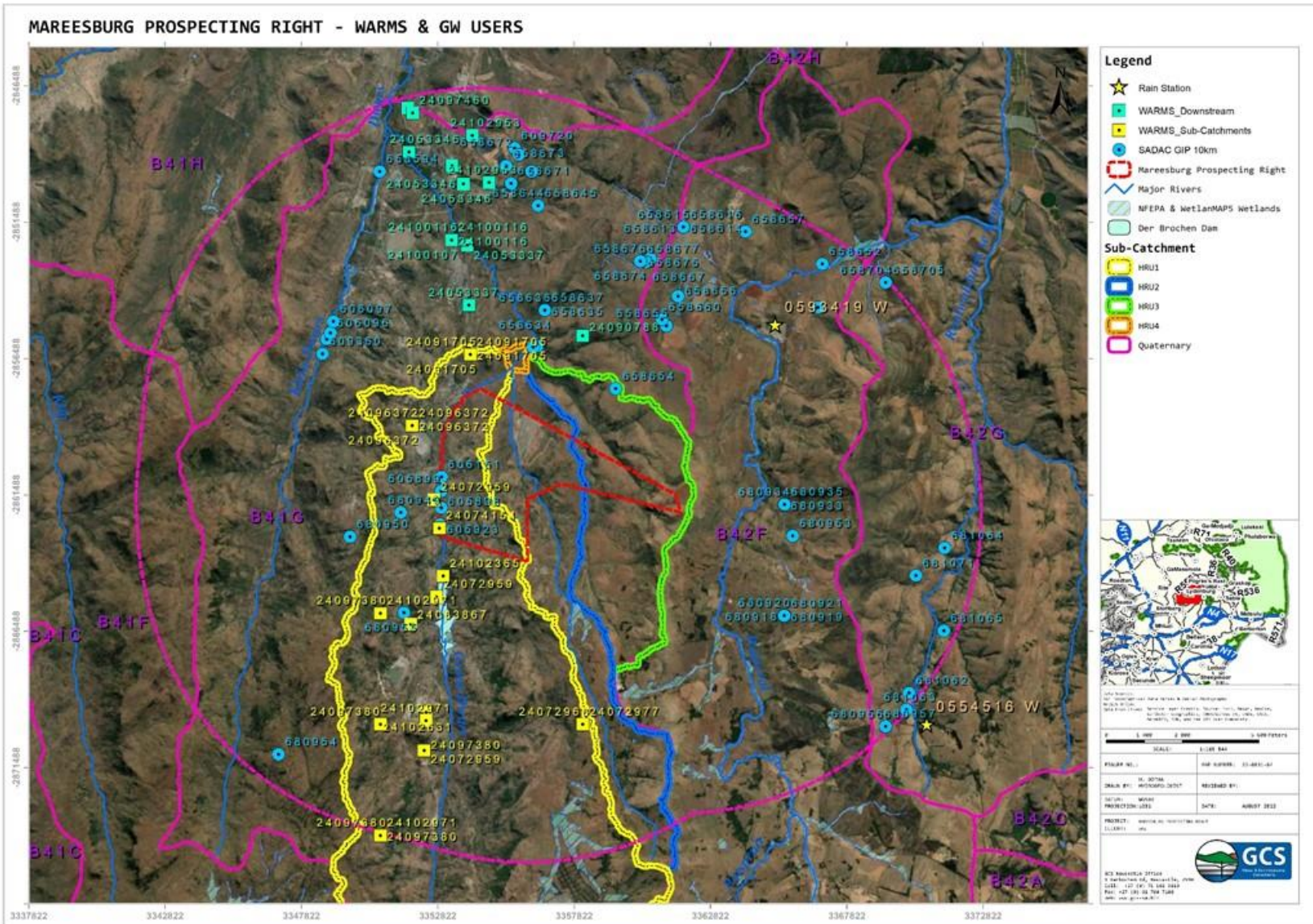


Figure 55: Surface water users and groundwater users identified in the project area



### **Depth to groundwater**

According to (Vegter, 1995) and (DWAf, 2006), the average groundwater level for the project area is in the order of 17 mbgl (meters below ground level). SADAC GIP boreholes within a 15 km radius of the site suggest a water level range from 3 to 128 mbgl, and an average of 17 mbgl (correlates well to literature data). Moreover, available data suggest that there is a good correlation ( $R \sim 98\%$ ) between groundwater and surface topography elevations (refer to **Figure 56**). Hence, the groundwater table is expected to mimic the topography and be shallower closer to perennial streams (i.e. these are prominent groundwater contributions to baseflow areas or areas where groundwater seepage from the resource into the aquifer units may take place).

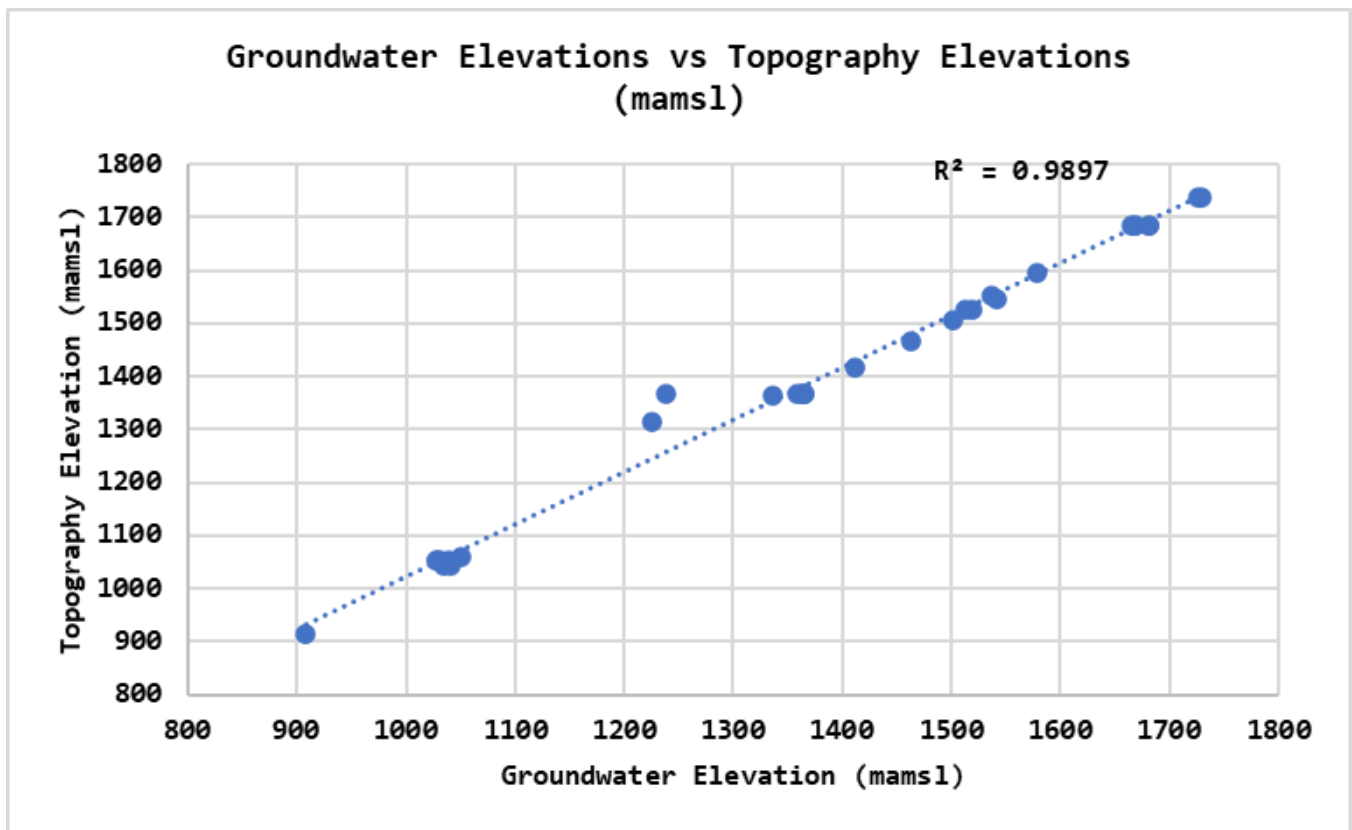


Figure 56: Groundwater elevation vs topography elevation - correlation

### **Surface water quality**

Surface water quality data for the Groot-Dwars River was obtained from DWS IWQS/WMS, station number B41 192 609 situated at the Groot Dwars River at Bridge on Road to Two Rivers Mine (Lat: -24.92828 Lon: 30.10819), to illustrate water quality of the river and highly likely tributaries associated with it. A Maucha diagram is presented in **Figure 57**. Water quality data at the point is available from 2011 to 2018. From the data obtained the following is noted:

- TDS ranges from 419 to 257 mg/l
- EC ranges from 27 to 57 mS/m;
- pH ranges from 7.8 to 8.7;
- Na ranges from 7 to 11 mg/l;

- K ranges from 0.5 to 1.5 mg/l
- Ca ranges from 25 to 35 mg/l
- Mg ranges from 25 to 52 mg/l
- Cl ranges from 8 to 11 mg/l
- SO<sub>4</sub> ranges from 7 to 32.4 mg/l
- F ranges from 0.08 to 0.2 mg/l; and
- NO<sub>3</sub> ranges from 5 to 45.4 mg/l.

Limited impacts in terms of local mining are observed in the evaluated DWS data for the Groot-Dwars River.

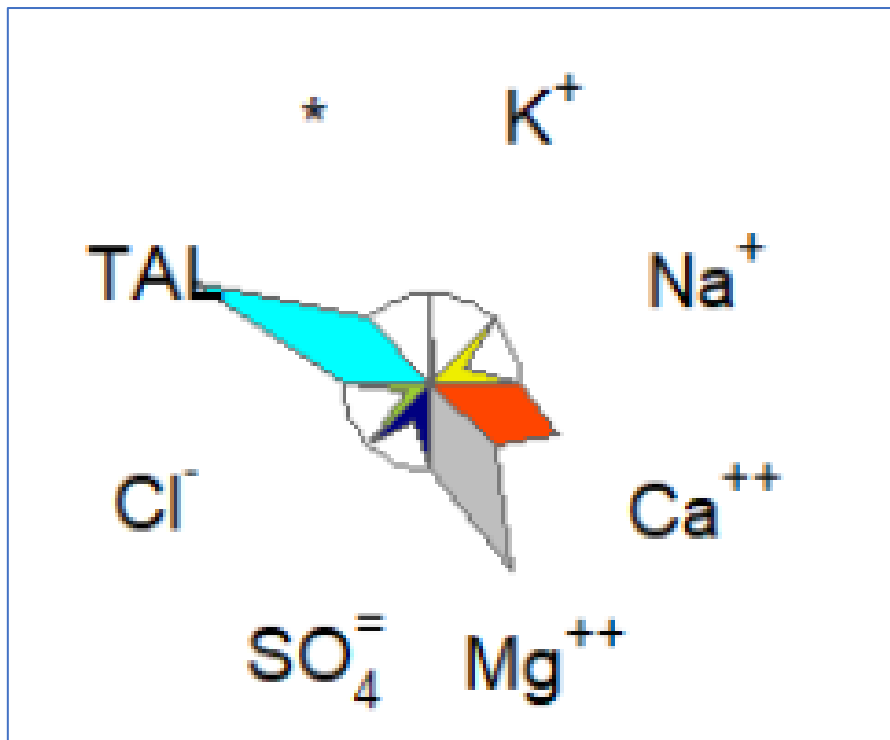


Figure 57: Mauca diagram relating to major ions in surface water environment (Groot-Dwars River – DWS, 2022)

### **Groundwater quality**

Literature suggests that the electrical conductivity (EC) for the underlying aquifer generally ranges between 70– 300 mS/m (milli Siemens/metre) and the pH ranges from 6 to 8 (refer to **Figure 58**). This means that groundwater abstracted from the aquifer can generally be used for domestic and recreational use, however, there may be some scaling issues in appliances and water pipes (King, Maritz, & Jonck, 1998).

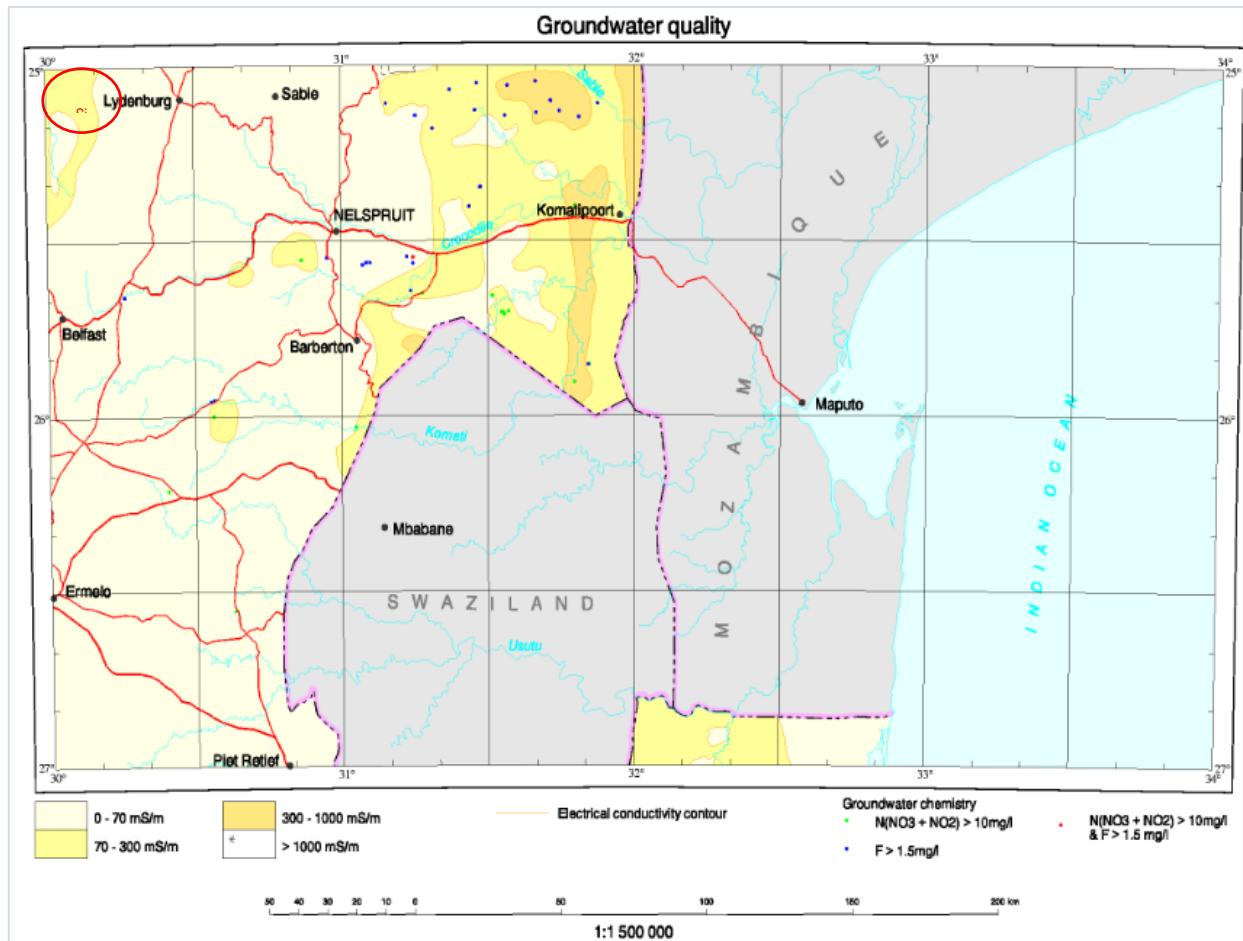


Figure 58: Groundwater conductivity for the study area (King, Maritz, & Jonck, 1998)

**Present Ecological State (PES) and Environmental sensitivity and Ecological importance (EIS) of the Groot Dwars River**

**Table 42** provides a summary of the PES and EIS for the quaternary catchment associated with the project area (WRC, 2015). According to the NBA 2018: SAIIE Dataset the Groot-Dwars River is largely modified (Class D), poorly protected (Ecosystem Protection Level) and critically endangered (Ecosystem Threat Status) (CSIR, 2018).

Table 42: Summary of PES and EIS for the Quaternary Catchment

QUATERNARY DRAINAGE	PES	EIS
B41G	Class D: Largely Modified	High

**b. OUTCOME OF DESKTOP FLOOD LINE DETERMINATION**

Flood peak flow for the recognised rivers, perennial streams and tributaries thereof associated with the project area were assessed. The Rational Method (3), Standard Design Flood (SDF) and Midgley & Pitman (MIPI) Method were applied. Design rainfall was retrieved from station 0593419W (Martenshoop (pol)) and used to calculate peak flow volumes. **Table 43** provides a summary of the design rainfall data used to calculate peak flows, and time concentrations were calculated based on the sub-catchment sizes and parameters. The upper limit “U” was used to estimate worst-case peak flows.

Table 43: Summary of design rainfall data used for peak flow estimates



DURATION	RETURN PERIOD (YEARS)						
	2U	5U	10U	20U	50U	100U	200U
5 min	10.5	14.4	17.3	20.5	24.9	28.6	32.6
10 min	15.4	21.1	25.3	29.9	36.3	41.8	47.6
15 min	19.2	26.3	31.6	37.3	45.3	52.1	59.4
30 min	24.2	33.2	40	47.2	57.3	65.9	75.1
45 min	27.8	38.1	45.8	54.1	65.8	75.6	86.1
1 hr	30.6	42	50.5	59.7	72.5	83.3	95
1.5 hr	35.1	48.2	58	68.5	83.2	95.6	108.9
2 hr	38.7	53.2	63.9	75.5	91.7	105.4	120.1
4 hr	46.4	63.7	76.6	90.4	109.8	126.2	143.8
6 hr	51.6	70.7	85.1	100.5	122	140.3	159.8
8 hr	55.6	76.2	91.7	108.3	131.5	151.2	172.2
10 hr	58.9	80.8	97.2	114.7	139.4	160.2	182.5
12 hr	61.8	84.7	101.9	120.3	146.1	168	191.4
16 hr	66.6	91.3	109.8	129.7	157.5	181	206.3
20 hr	70.5	96.8	116.4	137.4	166.9	191.9	218.6
24 hr	74	101.5	122	144.1	175	201.2	229.2
1 day	64.1	87.9	105.7	124.8	151.6	174.3	198.6
2 days	74.5	102.2	122.9	145.1	176.2	202.6	230.8
3 days	81.3	111.6	134.1	158.4	192.4	221.2	252
4 days	89.5	122.8	147.7	174.4	211.9	243.5	277.5
5 days	96.5	132.3	159.1	187.9	228.3	262.4	299
6 days	102.5	140.7	169.1	199.7	242.6	278.9	317.8
7 days	107.9	148.1	178.1	210.3	255.5	293.6	334.6

**Estimated flood return period**

Calculated peak flows are summarised in **Table 44**. Due to the large catchment areas, the RM (3) method peak flow estimates are considered inaccurate (RM suitable for catchments <15 km<sup>2</sup>) and it was further observed that the MIPI peak flows are in the same order of magnitude as the RM peak flows. As such the SDF peak flows were incorporated into the flood line modelling, as the peak flows more closely relate to that of the DWS (2011) Der Brochen Dam design peak flows. The flood line assessment is aimed at providing a worst-case inundation scenario to evaluate potential flooding risks. The peak flows presented are for the existing project setting.

Table 44: Summary of design peak flows for the delineated sub-catchments (m<sup>3</sup>/s)

CATCHMENT	METHOD								
	RM (3)			SDF			MIPI		
	1:20YR	1:50YR	1:100YR	1:20YR	1:50YR	1:100YR	1:20YR	1:50YR	1:100YR
	(M <sup>3</sup> /S)								
HRU1	267	402	557	533	787	1002	225	315	398



HRU2	109	164	228	213	315	400	79	111	140
HRU3	180	272	376	267	395	502	90	125	158
HRU4	6	9	12	11	17	22	8	11	14

**Model results**

The 1:50-year and 1:100-year flood lines are shown in *Error! Reference source not found.* It can be seen that larger flooded areas are expected for the Groot-Dwars River and the perennial tributary of the Groot-Dwars River, as opposed to the non-perennial stream making up the 2nd tributary of the Groot-Dwars River.

As stated previously, due to the nature of this project (non-invasive prospecting), flood lines for the ephemeral drainage lines in the study areas were not modelled.

A ground truthed hydrological survey and lidar survey, with updated flood lines for non-perennial drainage lines (ephemeral streams) would only be required if an invasive prospecting phase is implemented and if prospecting methods and prospecting areas that could change runoff patterns or impact the hydrological cycle take place.

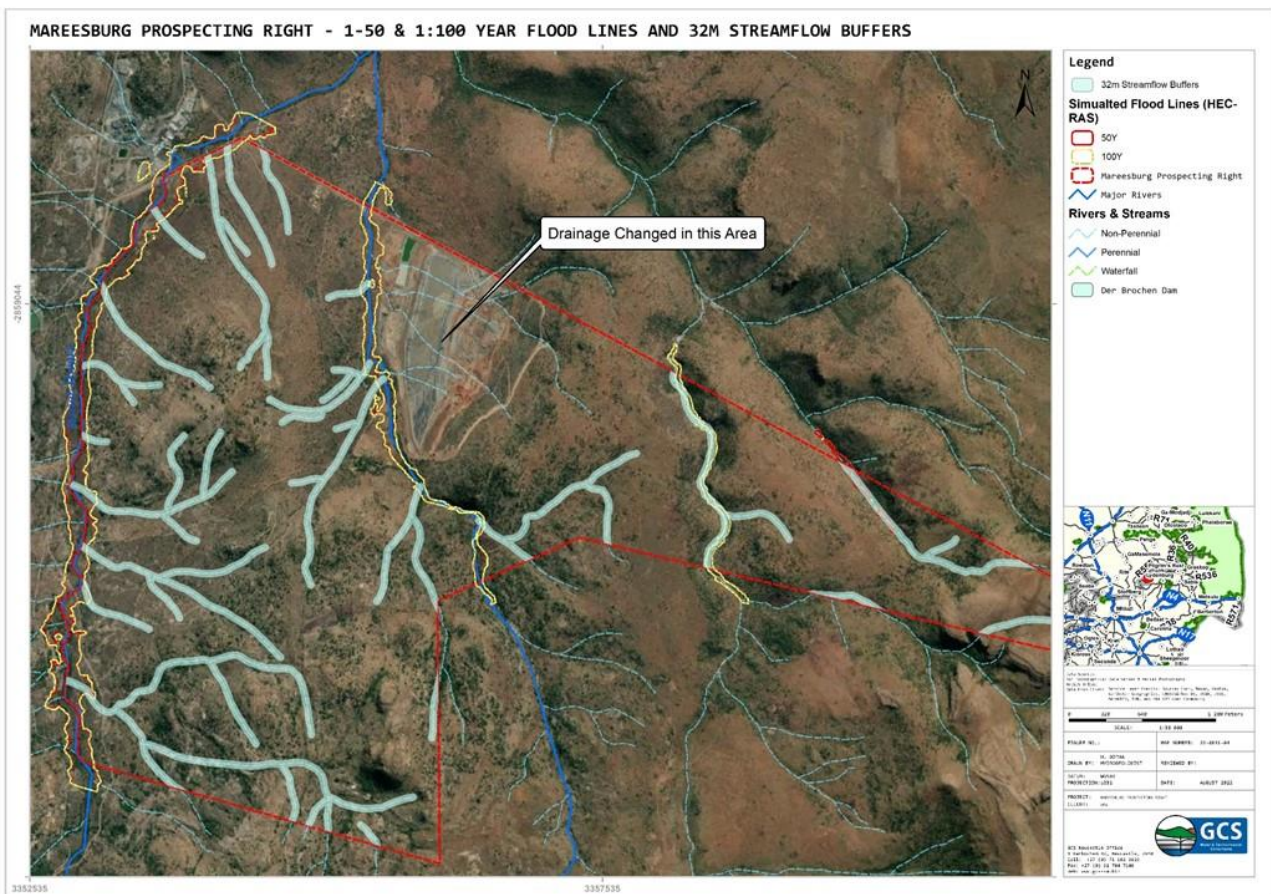


Figure 59: Simulated 1:50 and 1:100 year flood lines & 32m Streamflow Buffers

**Site-specific sensitivity & buffers (avoidance areas)**

The 1:100-year flood lines associated with the modelled river sections represents site-specific avoidance areas.



As there are several non-perennial (ephemeral) streams in the project area, and these have not been modelled as per the limitations of this investigation and project type, it is proposed that 32m buffers from the streamflow centre be considered, to safeguard against any probable flooding risk associated with these drainage features.

c. VERIFICATION STATEMENT

**Table 45** provides a summary of the verified sensitivity in relation to the determined flood lines.

Table 45: Verified sensitivity in relation to the determined flood line

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY
N/A	The 1:100-year flood lines and in 32m buffer areas demarcate <b>high</b> sensitivity areas, and moving away from these features can be considered <b>low</b> sensitivity areas.	Compliance and Mitigation Plan

d. IMPACT STATEMENT

Due to the project being a non-invasive prospecting process, no hydrological risks are associated with the activity. The current hydrological risk associated with this prospecting process is considered zero. Moreover, no cumulative impacts are likely.

e. REASONED OPINION FOR ISSUING EA

This assessment cannot find any grounds or identify high hydrological risks to not authorize the non-invasive prospecting phase.

## VII. NOISE

EARES Enviro-Acoustic Research was appointed by EMA on behalf of Nomamix (Pty) Ltd to conduct a baseline Noise Compliance Statement and Screening Report.

The following sections summarises the outcome.

The detailed report is attached as **Appendix F.6 – Noise Scoping Assessment**.

f. OUTCOME OF DESKTOP ASSESSMENT

**Table 46** provides a summary of environmental components that may contribute or change the sound character within the general site area associated with the proposed prospecting right.

Table 46: Summary of environmental component that may contribute or change the sound character in the area

TOPOGRAPHY	The Environmental Potential Atlas of South Africa (ENPAT) (Van Riet et al, 1998) describes the topography as “low mountains”. The locality of the proposed activities and infrastructure is within a mountainous region that will complicate noise propagation (partly blocking the noise propagation in certain directions) from potential noise-generating activities.
SURROUNDING LAND USE	The area in the direct vicinity of the project focus area (PFA) is mainly wilderness and mining, with some informal agricultural activities (animal husbandry) associated with the communities



	in the area.
GROUND CONDITIONS AND VEGETATION	The area falls within the savanna biome, with the vegetation type being north-eastern mountain grassland 5.
ROADS AND RAILWAY LINES	There are no roads or railway lines located within, or close to the project focus area. The only access road leading to the project focus area currently carries very little traffic, mainly servicing the local community
EXISTING AMBIENT SOUND LEVELS	<p>Ambient sound levels were measured by the Author (de Jager, 2021) over a three-night period at one location in the Vygenhoek community, located to the south-east of the farm Mareesburg. The project area was also visited a few times for other projects in the area.</p> <p>Based on the sound measurements:</p> <ul style="list-style-type: none"> <li>• Considering the arithmetic average based on the 10-minute LAeq values (38.5 dBA) as well</li> <li>• as the equivalent LAeq values based on the 16-hour daytime periods (43.1 dBA), ambient sound levels are typical of a rural noise district. This is in agreement considering the developmental character of the area;</li> <li>• Considering the arithmetic average based on the 10-minute LAeq values (27.4 dBA) as well</li> <li>• as the equivalent LAeq values based on the 8-hour night-time periods (27.4 dBA), ambient sound levels are typical of an undeveloped rural noise district. This is in agreement considering the developmental character of the area;</li> <li>• The statistical LA90 levels are very low both day and night, indicating little constant sounds that could raise this statistical indicator; and,</li> <li>• Spectral data indicate that while community noises does influence the daytime sound levels, nights are quiet with mainly natural noises dominating.</li> </ul> <p>Considering the results of the measurements, the developmental character of the area as well as audible observations, the recommended noise limits would be typical of a rural noise district. This is quieter than the WHO and IFC guidelines yet in line with the character of the area. The acceptable rating level for the area would be;</p> <ul style="list-style-type: none"> <li>• 45 dBA for the daytime period; and</li> <li>• 35 dBA for the night-time period.</li> </ul>
POTENTIAL SENSITIVE RECEPTORS	<p>Residential areas and potential noise-sensitive developments/receptors (NSR) were initially identified using tools such as Google Earth®, with the status of the NSR confirmed during the November 2020 site visit. It is assumed that these locations are still noise-sensitive. The closest potential NSR (receptors identified within 2,000m from the PFA) is highlighted in <b>Figure 61</b>. Also indicated on this figure are the 500, 1,000 and 2,000 m buffer zones.</p> <p>Generally, noise from prospecting activities:</p> <ul style="list-style-type: none"> <li>• Could be significant within 500m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated);</li> <li>• May be clearly audible and potentially annoying during quiet periods up to 1000m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated); and</li> <li>• Audible up to 2,000m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated). Noise from any drilling activities should be of a low concern further than 2,000m from such activities.</li> <li>• Are audible up to a distance of 2,000 m at night, though the noises may be audible up to 4,000 m during very quiet periods at night with certain meteorological conditions. These noises are normally of a low concern at distances greater than 2,000 m from noise generating activities.</li> </ul> <p>Based on information gained during the site visit, the NSR 1 represents a number of residential</p>



	dwellings used by employees of the nearby Der Brochen Anglo-American mine in the area. NSRs 2 to 16 represent a number of structures used for residential purposes by the Vygenhoek community.
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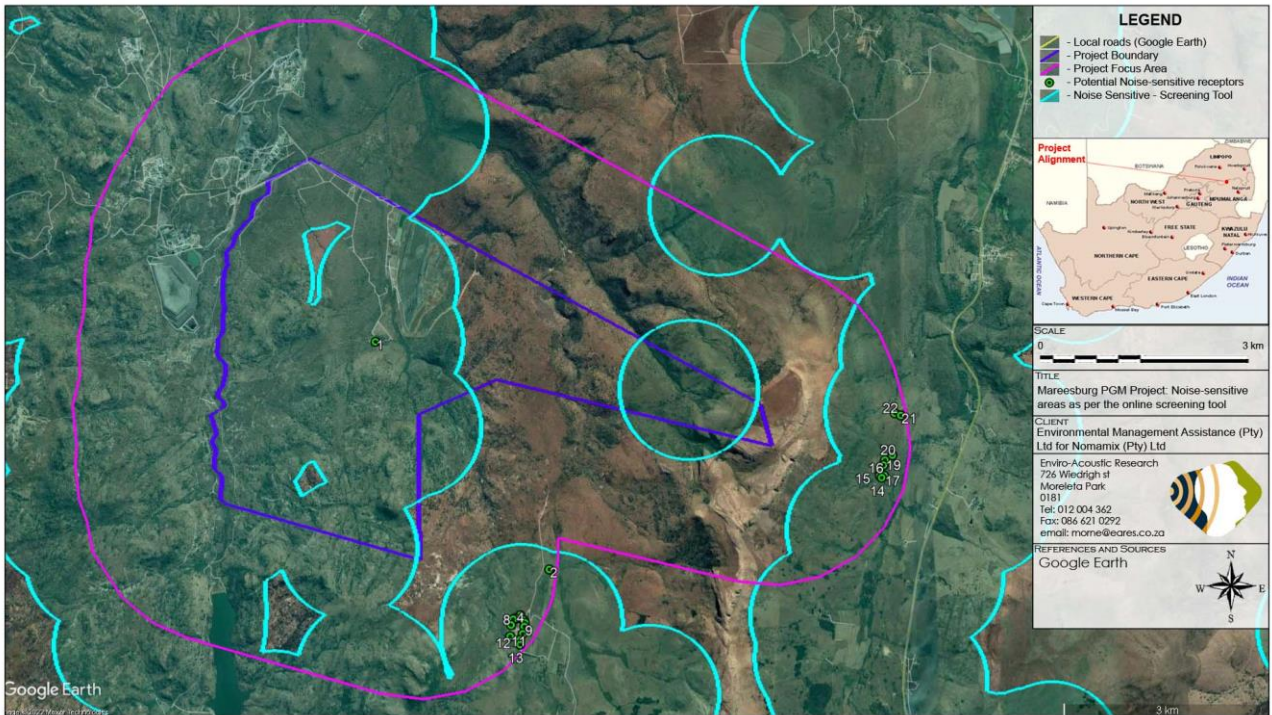


Figure 60: Noise sensitive areas identified by the Screening Tool

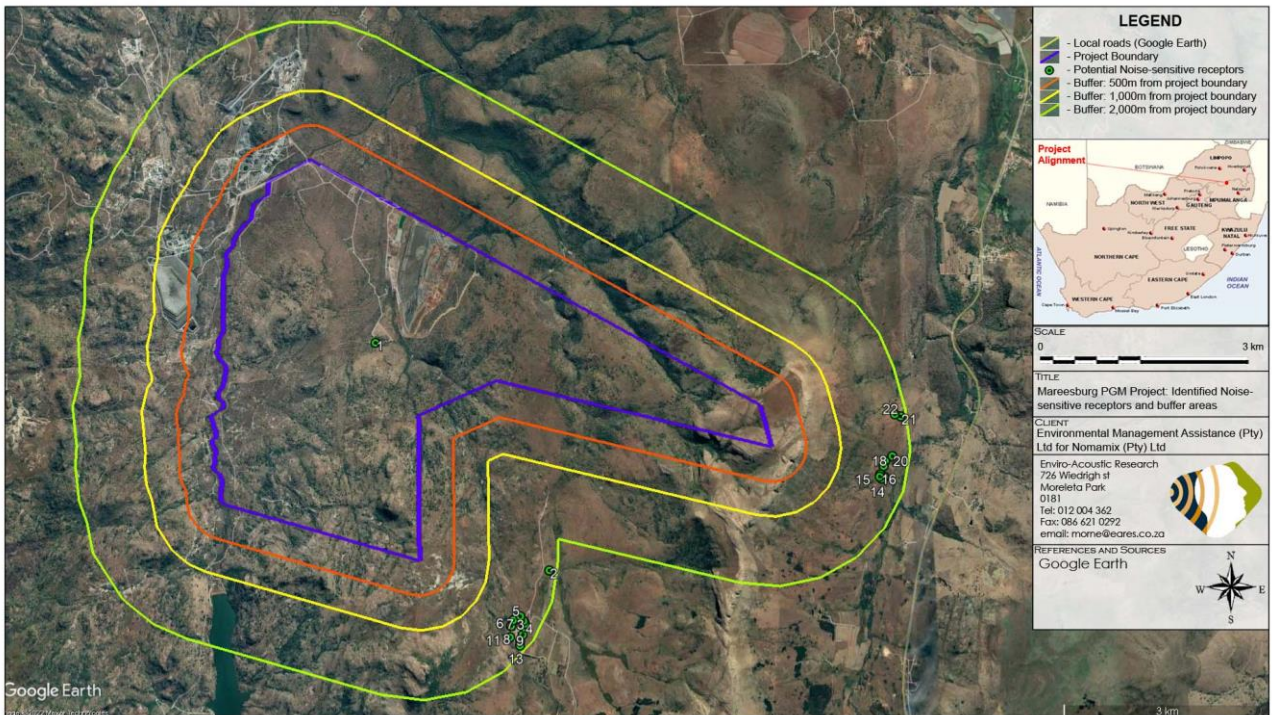


Figure 61: Noise sensitive areas and receptors close to the PFA of the proposed non-invasive prospecting rights area



**g. VERIFICATION STATEMENT**

An initial desktop verification was done, considering the noise layer as available from the National Web based Environmental Screening Tool6 as well as aerial imagery available on from Google Earth ©. Aerial images available on Google Earth © is recent (dated 3 March 2021) and of sufficient resolution to identify and verify potential noise sensitive areas as illustrated on **Figure 60**. This screening report will be sufficient for non-invasive (desktop analysis of data) prospecting and the available information is sufficient to advice on the way forward in terms of acoustics.

The online screening tool define most of the Project Focus area to have a “Very High” sensitivity to noise, with this desktop assessment confirming the “Very High” sensitivity for a number of NSR, though large areas, identified to have a “very high” sensitivity to noise are not noise sensitive. As such a noise specialist study must be appended to any environmental impact assessment, but considering that the proposed prospecting will be non-invasive, a noise specialist study can take the form of a Screening Noise Report in terms of SANS 10328:2008.

**Table 47** provides the summary of the verification outcome.

*Table 47: Verified sensitivity in terms of Noise*

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY
<b>Very High</b>	<b>Very High</b>	Screening report in terms of SANS 10328:2998 for non-invasive prospecting.

**h. IMPACT STATEMENT**

While there are numerous potential NSR staying within the PFA, the proposed prospecting will be non-invasive and the proposed activities will not change ambient sound levels within the PFA, nor result in any unreasonable or annoying noises. The risk of a noise impact (for non-invasive prospecting) is of a low significance.

**i. REASONED OPINION FOR ISSUING THE EA**

It is recommended that the proposed prospecting activities be authorized from an acoustic perspective.

The recommendation in this report is therefore conditional that the prospecting activities are non-invasive as reported by the applicant. For non-invasive prospecting, no additional impact management or any noise monitoring are required for inclusion in the EMPr, nor are any further Noise Scoping or other acoustical studies required.

However, if any additional diamond drilling activities are planned or anticipated it is recommended that this be investigated in a noise specialist assessment.

**(b) DESCRIPTION OF THE CURRENT LAND USES**

Find **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

**(c) DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON SITE**



As part of the specialist desktop assessment and site sensitivity verification several environmentally and socially sensitive receptors were identified.

The defined sensitivities should be considered as “no-go” areas or “areas requiring further investigation and assessment”, should the proposed scope associated with this prospecting right change, i.e. intrusive prospecting.

Find **Appendix C – Site Layout Plan, Sensitivities, and Land Use.**

**(d) ENVIRONMENTAL AND CURRENT LAND USE MAP**

*(Show all environmental and current land use features)*

Find **Appendix C – Site Layout Plan, Sensitivities, and Land Use.**

**iv) IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTEND, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS**

*(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated)*

This section summarises the potential impacts associated to the proposed non-invasive prospecting. For the purpose of this desktop impact assessment, the potential impacts that must be considered in the event of a change in scope (i.e. change from non-invasive prospecting to intrusive prospecting that includes drilling, trenching or bulk sampling) will be briefly highlighted. For this purpose, it will be considered as the “Planning Phase”. The potential impacts and risks are explored by investigating each aspect (i.e. air quality, soil quality, water quality etc.) associated to the proposed activities.

The provided management and mitigation measures only summarise the approach taken to manage each risk. A detailed mitigation plan will form part of the EMPr (**Part B – Environmental Management Programme Report**).

**Table 48** provides the explanation of colour indicating the significance of the assessed potential impacts.

Table 48: Explanation of colour indicator

COLOUR	SIGNIFICANCE POINTS	EXPLANATION
Green	≤ 30	LOW environmental significance
Orange	31 - 60	MODERATE environmental significance
Red	> 60	HIGH environmental significance

The significance rating represented in this section is from a desktop perspective based on the findings of the various specialists. It also excludes the following considerations:

- Assessment of alternatives, i.e. prospecting methods, site layout (only the proposed layout as provided by the applicant was considered);
- Mitigation measures; and
- Management measures.



**NON-INVASIVE PROSPECTING AND PLANNING PHASE**

AGRICULTURE AND SOIL

ASPECT		SOIL & AGRICULTURAL					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)						
		D	E	M	P	S		
<b>Non-invasive Prospecting</b>	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2		
<b>Consideration of a change in scope</b>	<p><b>Loss of agricultural land</b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Situating infrastructures associated with the scope change within areas identified as high sensitivity related to agricultural use may cause the loss of arable land within the site and adjacent properties.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Loss of arable land and fertile soil leads to the degradation of the overall agricultural potential for the surrounding community.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Food scarcity and reduction in income generated from agricultural activities.</li> </ul> <p><b>Erosion formation and soil pollution</b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Inadequate planning and assessment of required stormwater management infrastructure associated with the proposed prospecting has a high potential of exposing soils to environmental factors including rainfall and wind.</li> <li>Sediment release due to inadequate storm water management infrastructures into the receiving environment causing the degradation of the soil profile.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Loss of arable land and fertile soil leads to the degradation of the overall agricultural potential for the surrounding community.</li> <li>Formation of erosion gullies have an impact on nutrient cycling, with knock on effects on the fertility of the soil. This reduces the viability of the soils for use in the rehabilitation of areas and additional soils will need to be brought in for this purpose.</li> <li>Pollutants entering the soil profile may have the potential to affect the water quality if stormwater is not treated or managed before release into the natural environment.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Food scarcity and reduction in income generated from agricultural activities.</li> <li>Cost implication associated with rehabilitation due to import of soils and increases the likelihood of contaminant introduction within an area with alien invasive species (both floral and faunal).</li> <li>Change in the baseline soil profile cumulatively effects the micro fauna and flora environment.</li> </ul>	2	2	6	3	30	Avoid or Remedy	
								<p><i>DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED</i></p> <p>Field verified data indicates that the study area is of <b>moderate to low</b> agricultural sensitivity. This can be attributed to the inherent duplex soil properties which dominates the study area, which includes soils of Swartland, Darnall and Glen formation. These soils present a challenge in a sense of root impediment presented by the high in clay top soil and subsoil horizons. Under the right circumstances these soils can be very productive for annual crops but they require intensive management and may not be economically viable to cultivate on a large scale. The soils which are most suitable for cultivation such as the Clovelly and Nkonkoni formation have been utilised for residential developments so as to avoid building on soils of duplex character and thus limiting the spatial extent of these soils.</p> <p><i>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</i></p> <p>The overall impact is anticipated to be <b>low</b> and within acceptable levels from a soil and land capability point of view. However, should a change in scope be considered, areas used for grazing and subsistence cultivation will potentially be impacted, which will ultimately impact on the local and regional livestock production. Although agricultural studies under the CARA Act 1983 prioritise crop cultivated agriculture, it is imperative that land with grazing capability is also conserved where feasible.</p> <p><i>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</i></p> <p>The potential impacts/risks may potentially be further <b>mitigated and or avoided</b> by implementing the following measures:</p> <ul style="list-style-type: none"> <li>Assessment of alternatives i.e. prospecting methods, location of infrastructures, and reduction of the prospecting footprint;</li> <li>Control though soil conservation and management during i.e. intrusive prospecting;</li> <li>Avoid the loss of fertile soil by effectively implementing storm water management and erosion control throughout i.e. intrusive prospecting activities;</li> <li>Avoid contamination of soil resources through the development, implementation and review of incident management and emergency preparedness plans; and</li> <li>Remedy through effectively and concurrently rehabilitating disturbed areas.</li> </ul> <p>All mitigation options must be considered during the required process to amend the EA to determined the degree to which the impact/risks can be avoided, managed, or mitigated.</p>





ARCHAEOLOGY, CULTURAL, AND PALAEOLOGY

ASPECT		ARCHAEOLOGY, CULTURAL, AND PALAEOLOGY						
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY
		D	E	M	P	S		
Non-invasive Prospecting	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2	Avoid	DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED
								Based on the current information obtained for the area at a desktop level it is anticipated that any heritage resources that occur within the proposed development area will have a Local Significance (LS), Grade 3B or lower field rating and all sites should be mitigatable. Graves are of high social significance (Field rating GP A) and can be expected anywhere on the landscape.
Consideration of a change in scope	<p><b>Loss of heritage and cultural resources</b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Site selection near or within close proximity to sites of historical and cultural importance leading to the destruction of heritage resources or graves.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Loss of heritage and history for the future generation of the affected community.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Community unrest.</li> <li>Permanent loss of sites of historical and cultural significance.</li> </ul>	2	2	8	4	48		<p>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</p> <p>Significance rating of sites, mitigation measures and magnitude of possible impacts can only be determined after the field based HIA, should the non-invasive nature of the proposed prospecting right change.</p> <p>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</p> <p>The potential impacts/risks may potentially be further <b>avoided</b> by implementing the following measures:</p> <ul style="list-style-type: none"> <li>Management actions identified in the revised EMP; and</li> <li>Developing a chance find procedure during all phases of the proposed development.</li> </ul> <p>All mitigation options must be considered during the required process to amend the EA to determine the degree to which the impact/risks can be avoided, managed, or mitigated.</p>

TERRESTRIAL BIODIVERSITY

ASPECT		TERRESTRIAL BIODIVERSITY						
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY
		D	E	M	P	S		
Non-invasive Prospecting	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2	Avoid /Control	DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED
								Due to the <b>historical disturbances</b> and increase in residential infrastructure, <b>most vegetation</b> within the prospecting area was <b>modified from the reference state of Makhado Sweet Bushveld</b> . <b>Natural</b> vegetation was recorded on <b>the higher lying rocky outcrops</b> within the <b>western portion</b> of the site, while some natural vegetation remains along <b>drainage lines</b> .
Consideration of a change in scope	<p><b>Degradation of terrestrial biodiversity</b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>An increased disturbance of the natural environment associated with the overall footprint of change in scope (i.e. intrusive prospecting).</li> <li>Positioning of the proposed prospecting in a high terrestrial sensitive area, poses a risk of altering the habitat of protected and endangered fauna and flora species.</li> <li>Positioning the prospecting area and corresponding infrastructures in areas classified as a high sensitivity, will significantly impact the terrestrial biodiversity.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Intrusion on the surrounding ecological support areas.</li> <li>Loss of protected and endangered fauna and flora species.</li> <li>Failing to meet National Biodiversity Targets.</li> </ul>	2	2	8	4	48		<p>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</p> <p>The <b>ecological corridor south</b> of the proposed prospecting right area must not be allowed to deteriorate as a result of intrusive prospecting supporting the <b>very high</b> terrestrial, specifically from an animal species perspective, sensitivity. All <b>rivers/streams</b> within should be considered as <b>highly sensitive</b> as they provide corridors, unique habitats and water provision. All remaining <b>natural bushveld along the koppies</b> and the riverine areas are considered as <b>medium sensitivity</b> in terms of general habitat provision to existing faunal populations on site (retaining these areas should allow the on-site natural and indigenous fauna to persist in the area).</p> <p>The desktop assessment of the available information and site verification results indicated that about half of the vegetation within the prospecting rights area were modified or in a semi-natural state. Some remnant <b>Makhado Sweet Bushveld</b> is in a <b>semi-natural state</b> as its ecological function is maintained while the vegetation composition and structure are largely intact. The Makhado Sweet Bushveld is considered as <b>medium sensitivity</b> to intrusive prospecting, provided that large tracks of this group are not cleared.</p>



<p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Loss of vegetation and habitat leads to the overall degradation of the terrestrial ecology.</li> <li>Critical support regions to surrounding ecological support and protected areas are affected and may lead to the degradation of the protected area's ecology.</li> </ul>								<p>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</p>
								<p>The potential impacts/risks may potentially be further <b>avoided or mitigated</b> by implementing the following measures:</p> <ul style="list-style-type: none"> <li>The implementation of a species search and rescue prior to the commencement of construction activities;</li> <li>Appointing a suitably qualified Environmental Control Officer (ECO) prior to the commencement of any activities monitoring all vegetation clearance activities;</li> <li>Obtaining the required permits for the removal of protected species; and</li> <li>Awareness training of all contractors and permanent employees.</li> </ul> <p>All mitigation options must be considered during the required process to amend the EA to determine the degree to which the impact/risks can be avoided, managed, or mitigated.</p>

AQUATIC BIODIVERSITY

ASPECT		AQUATIC BIODIVERSITY					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)						
		D	E	M	P	S		
Non-invasive Prospecting	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2	<p>DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED</p> <p>The <b>low</b> risk to the freshwater environment, due to <b>non-invasive prospecting</b>, would change in the event of a change in nature of the proposed prospecting right.</p> <p>The <b>freshwater features</b> in the study area have been confirmed to be of <b>very high aquatic biodiversity / freshwater sensitivity</b>.</p>	
Consideration of a change in scope	<p><u>Loss of aquatic biodiversity/ Direct Loss of Wetland Features</u></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Locating the intrusive prospecting activities within 500m of a wetland, poses a risk in altering the support regions into the wetland.</li> <li>Site clearing and topsoil stripping in Wetlands will cause the loss of micro and macro aquatic species. The potential presence of wetland features with the proposed mining area is likely to result in the direct loss of potential wetland features present.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Alteration of wetland support zones poses the risk of alien invasive species the invade, leading to the deterioration of the nearby wetland system.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Intrusive prospecting activities may result in impacts to drivers of wetland features adjacent to and/or downstream of the proposed prospecting right areas, resulting in the degradation and loss of ecosystem services provided by wetlands.</li> <li>Intrusive prospecting may impact on national protected areas targets and provincial freshwater conservation targets, both of which are expected to be cumulative in the impact is to be considered with other regional impacts that have or are expected to have on such areas.</li> <li>Loss of unique biodiversity features.</li> </ul> <p><u>Erosion and sedimentation of Wetlands</u></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Locating access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly.</li> <li>Improper or ineffective storm water runoff management features poses a risk of contributing to the sedimentation and siltation of watercourses.</li> </ul>	3	3	10	4	64	<p>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</p> <p>Should the prospecting activities, as proposed, <b>remain non-invasive</b> (with no physical activity on the site), the prospecting activities will <b>not result in an impact</b> (new or cumulative) on the freshwater features in the study area.</p> <p>Due to the <b>high sensitivity</b> associated with the <b>freshwater features</b> in the study area, it is recommended that a future <b>Aquatic Biodiversity Specialist Assessment</b> must be undertaken should the <b>prospecting</b> rights application <b>be altered or approved to allow any activities other than non-invasive</b> activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities.</p>	
	<p>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</p> <p>The potential impacts/risks may potentially be further <b>avoided or mitigated</b> by implementing the following measures:</p> <ul style="list-style-type: none"> <li>Control through the implementation of storm water management and erosion control;</li> <li>Avoid impacts through adequately managing effluent and runoff;</li> <li>Avoid accidental release through the development, implementation, and review of incident management and emergency preparedness plans;</li> <li>Control through the continuing awareness training of all personal throughout the entire life cycle of the proposed development; and</li> <li>Remedy through the effective implementation of rehabilitation measures.</li> </ul> <p>All mitigation options must be considered during the required process to amend the EA to determine the degree to which the impact/risks can be avoided, managed, or mitigated.</p>							



	<p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>In addition, the presence of bare soil associated with stockpiles during mining activities will result in a change in the stormwater runoff volume and velocity entering adjacent wetland systems.</li> <li>Various impacts have been attributed to sedimentation of aquatic ecosystems, including reduction of light penetration (resulting in reduction in photosynthesis and subsequently, productivity), alteration of foraging dynamics of both carnivores and herbivores, impacting on predator and prey relationships, clogging of gills, rendering the watercourse unfit for various aquatic organisms, truncating and shifting the trophic pyramid, absorption of nutrients onto suspended particles, rendering them unavailable and thereby reducing the productivity of the watercourse, and filling of interstitial spaces, thereby destroying habitat for macro invertebrates and vertebrates owing to sedimentation, etc.</li> <li>Sediment deposition within the western tributary is further expected to smother available stones biotopes, leading to a reduction in abundance and diversity of flow-sensitive hydraulic habitat, ultimately resulting in a loss of sensitive aquatic biota noted to be present.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Alteration of aquatic ecology of direct affected watercourses and downstream watercourses.</li> <li>Loss of unique biodiversity features.</li> <li>The proposed activity is expected to impact on national protected areas targets and provincial freshwater conservation targets, both of which are expected to be cumulative if the impact is to be considered with other regional impacts that have or are expected to have on such areas.</li> </ul> <p><b><u>Water Quality Deterioration/Contamination of Water Resource</u></b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Dirty water runoff from intrusive prospecting footprint(s) enters the adjacent aquatic ecosystem, water quality deterioration is likely to result, including increases in turbidity, sulphates and metal concentrations (e.g. aluminium and iron), and potentially a drop in pH. Accordingly, aquatic assemblages are likely to be negatively affected, with a decrease in diversity expected.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Over an extended period, the exposure to contamination will cause the degradation of fauna and flora habitats and affect the surface and sub-surface water quality.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Mismanagement of prospecting-generated waste and pollutants (including hydrocarbons, construction waste, hazardous chemicals, etc.) is likely to result in these substances or their derivatives entering and polluting the sensitive aquatic environments either directly through surface runoff during rainfall events, or subsurface water movement.</li> <li>An increase in pollutants will lead to changes in the water quality of the wetlands and watercourses, affecting their ability to act as ecological corridors within the development landscape.</li> <li>The linked nature of the wetland systems to downstream water resources will result in pollutants being carried downstream from the mine construction site having consequences on further downstream users.</li> <li>The proposed activity is expected to impact on national protected areas targets and provincial freshwater conservation targets, both of which are expected to be cumulative if the impact is to be considered with other regional impacts that have or are expected to have on such areas.</li> </ul> <p><b><u>Invasive alien plant encroachment</u></b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Alien invasive trees and shrubs are expected to increase within the area as these species tend to invade areas that have been disturbed (e.g. on stockpiles and excavated or eroded areas). Such disturbed areas are likely to act as seed areas that will ultimately facilitate the invasion of associated watercourses and riparian areas.</li> </ul>																							
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	<p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches, posing an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Critical support regions to surrounding ecological support and protected areas are affected and may lead to the degradation of the protected area’s ecology.</li> </ul>							
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SURFACE WATER RESOURCE

ASPECT	SURFACE WATER RESOURCE									
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY		
		D	E	M	P	S				
<b>Non-invasive Prospecting</b>	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2		<i>DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED</i>		
								The proposed <b>non-invasive prospecting</b> is identified as <b>low with no impacts/risks</b> associated with the determined flood line. However, should the nature of the proposed non-invasive prospecting change to <b>intrusive prospecting</b> , all activities within the <b>100m buffer of the 1:100-year flood line</b> to be <b>avoided</b> .		
								<i>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</i>		
								A high sensitivity classification is defined as a water resource that is located in the vicinity of a high-risk activity such as intrusive prospecting. In this instance if prospecting occurs <b>within 100m of the 1 in 100-year flood</b> line it will be considered <b>high sensitivity</b> .		
								<i>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</i>		
<b>Consideration of a change in scope</b>	<p><b>Degradation of natural water resources/Water resource contamination</b></p> <p><u>Direct impact:</u></p> <ul style="list-style-type: none"> <li>Locating intrusive prospecting activities within proximity to a natural drainage line or wetland, poses the risk of associated activities increasing the overall sediment load into the water resource.</li> <li>Locating access roads through drainage lines may cause sedimentation and siltation of watercourses if not managed properly.</li> <li>Improper or ineffective storm water runoff management features poses a risk of contributing to the sedimentation and siltation of watercourses.</li> </ul> <p><u>Indirect impact:</u></p> <ul style="list-style-type: none"> <li>An increased sediment load decreases the overall water quality of surface water resources.</li> <li>Over an extended period, the exposure to contamination will cause the degradation of fauna and flora habitats and affect the surface and sub-surface water quality.</li> </ul> <p><u>Cumulative impact:</u></p> <ul style="list-style-type: none"> <li>Mismanagement of prospecting-generated waste and pollutants (including hydrocarbons, construction waste, hazardous chemicals, etc.) is likely to result in these substances or their derivatives entering and polluting the sensitive aquatic environments either directly through surface runoff during rainfall events, or subsurface water movement.</li> <li>An increase in pollutants will lead to changes in the water quality of the wetlands and watercourses, affecting their ability to act as ecological corridors within the development landscape.</li> <li>The linked nature of the wetland systems to downstream water resources will result in pollutants being carried downstream from the mine construction site having consequences on further downstream users.</li> <li>The proposed activity is expected to impact on national protected areas targets and provincial freshwater conservation targets, both of which are expected to be cumulative if the impact is to be considered with other regional impacts that have or are expected to have on such areas.</li> <li>Alteration of aquatic ecology of direct affected watercourses and downstream watercourses.</li> <li>Loss of unique biodiversity features.</li> </ul>	3	3	10	4	64	Avoid /Control	<i>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</i>		
								The potential impacts/risks may potentially be further <b>managed (controlled)</b> by implementing the following measures:		
								<ul style="list-style-type: none"> <li>Control through the implementation of storm water management and erosion control;</li> <li>Avoid impacts through adequately managing effluent and runoff;</li> <li>Avoid accidental release through the development, implementation, and review of incident management and emergency preparedness plans;</li> <li>Water conservation through monitoring water use and quality throughout the entire life cycle of the proposed development;</li> <li>Control through the continuing awareness training of all personal throughout the entire life cycle of the proposed development; and</li> <li>Remedy through the effective implementation of rehabilitation measures.</li> </ul>		
								All mitigation options must be considered during the required process to amend the EA to determine the degree to which the impact/risks can be avoided, managed, or mitigated.		



	All potential impacts/risks identified under the "Aquatic Biodiversity" section directly or indirectly relates to surface and groundwater resources and should also be taken into consideration.					
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NOISE

ASPECT	NOISE							
ACTIVITIES	POTENTIAL IMPACT/RISK	DESKTOP SIGNIFICANCE RATING (PRE-MITIGATION)					MITIGATION TYPE	MANAGEMENT AND/OR MITIGATION EXTEND SUMMARY
		D	E	M	P	S		
Non-invasive Prospecting	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the scope change, including but not limited the impacts/risks listed below:	1	1	0	1	2	Control	<i>DEGREE TO WHICH IMPACT/RISK CAN BE REVERSED</i>
Consideration of a change in scope	<b>Noise generation</b>	2	2	8	4	48		While there are numerous potential noise sensitive receptors staying within the proposed prospecting right area, the proposed non-invasive nature will <b>not change the current ambient sound levels</b> , nor result in any unreasonable or annoying noises.
	<i>Direct impact:</i>							<i>DEGREE TO WHICH IMPACT/RISK MAY CAUSE IRREPLACEABLE LOSS OF RESOURCE</i>
	<ul style="list-style-type: none"> <li>Increase in noise level at receptors. Disturbing noises. Increased noises or disturbing noises may increase annoyance levels with project.</li> <li>Locating the proposed development within close proximity to sensitive receptors poses a risk of the overall sense of place to the surrounding community.</li> <li>Degradation of employees and community hearing health.</li> </ul>							The risk of a noise impact (for <b>non-invasive prospecting</b> ) is of a <b>low significance</b> . However, should the scope of the proposed prospecting change as being intrusive, the impacts associated must be further investigated in a full noise specialist assessment.
	<i>Indirect impact:</i>							<i>DEGREE TO WHICH IMPACT/RISK CAN BE AVOIDED, MANAGED OR MITIGATED</i>
<ul style="list-style-type: none"> <li>Potential increase of community unrest and complaints.</li> <li>Hearing loss of employees and community members.</li> </ul>	The potential impacts/risks may potentially be further <b>managed (controlled)</b> by implementing the following measures: <ul style="list-style-type: none"> <li>Implementation of the monitoring programme as specified in the EMP; and</li> <li>Ensuring sufficient noise screening measures should any specific activity exceed the 85 dBA threshold.</li> </ul>							
<i>Cumulative impact:</i>	<ul style="list-style-type: none"> <li>Loss of production due to community strikes.</li> </ul>	All mitigation options must be considered during the required process to amend the EA to determine the degree to which the impact/risks can be avoided, managed, or mitigated.						

OTHER ASPECTS TO BE CONSIDERED IN THE PLANNING FOR INTRUSIVE PROSPECTING

If the non-invasive nature of the proposed prospecting right change, the following aspects and all associated impacts/risks will be required to be further assessed:

- **Air Quality** – Depending on the type of change in scope, i.e. bulk sampling, trenching or core drilling, a baseline assessment will be required to determine if the potential impacts/risks that may affect the surrounding air quality. Specific mitigation measure to ensure activities conforms to relevant regulations must be identified. As a result, the EMP (Part B – Environmental Management Programme Report) must be amended to include all management and mitigation measures.
- **Waste Management** – All waste streams associated with intrusive prospecting activities must be defined. Based on the identified waste streams, a Waste Management Plan must be developed and the EMP (Part B – Environmental Management Programme Report) must be updated accordingly.
- **Socio-economic** – The socio-economic contribution related to intrusive prospecting activities must be further assessed in line with the “Needs and Desirability” questionnaire as per **Table 6: Questions indicated how the proposed development justified economic and social development in Section f)**. In addition, requirements specified by the International Finance Corporation (IFC) Environmental and Social Performance Standards must be taken into consideration.



**v) METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS**

*(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)*

The significance (quantification) of potential environmental impacts identified during the preliminary assessment have been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, of the Department of Environmental Affairs and Tourism, April 1998):

**Occurrence**

- Probability of occurrence (how likely is it that the impact may occur?)
- Duration of occurrence (how long may it last?)

**Severity**

- Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the ranking scales represented by **Table 49**.

*Table 49: Ranking scale of the four factors considered to determined significance rating*

PROBABILITY	DURATION
1 - very improbable (probably will not happen)	1 - of a very short duration (0–1 years)
2 - improbable (some possibility, but low likelihood)	2 - of a short duration (2-5 years)
3 - probable (distinct possibility)	3 - medium-term (5–15 years)
4 - highly probable (most likely)	4 - long term (> 15 years)
5 - definite (impact will occur regardless of any prevention measures)	5 - permanent
EXTENT	MAGNITUDE
1 - limited to the site	0 - small and will have no effect on the environment
2 - limited to the local area	2 - minor and will not result in an impact on processes
3 - limited to the region	4 - low and will cause a slight impact on processes
4 - will be national	6 - moderate and will result in processes continuing but in a modified way
5 - will be international	8 - high (processes are altered to the extent that they temporarily cease)
	10 - very high and results in complete destruction of patterns and permanent cessation of processes

The environmental significance of each potential impact is assessed using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:



- < 30 significance points = **LOW** environmental significance.
- 31- 60 significance points = **MODERATE** environmental significance
- 60 significance points = **HIGH** environmental significance

**vi) THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED**

*(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)*

As discussed in **Section g),h), and i)**, due to the non-invasive prospecting nature of the proposed prospecting right application, no alternatives were considered.

**vii) THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK**

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

As indicated in **Section iv)**, no impacts are anticipated to be associated with the proposed non-invasive prospecting. However, should the nature of the scope change, potential impacts/risks have been identified that will be required to be further assessed as part of the amendment process as defined by the NEMA 2014 Regulations (including any current and future amendments).

**Part B – Environmental Management Programme Report**, provides measures to be considered in the event of a change in scope and will be required to be amended.

**viii) MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED**

As discussed in **Section g),h), and i)**, due to the non-invasive prospecting nature of the proposed prospecting right application, no alternatives were considered.

**ix) STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE**

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

As discussed in **Section g),h), and i)**, due to the non-invasive prospecting nature of the proposed prospecting right application, no alternatives were considered.

**J) FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS, AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY**

*(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)*



(I) DESCRIPTION OF ALL ENVIRONMENTAL ISSUES AND RISKS THAT WERE IDENTIFIED DURING THE EIA PROCESS

See **Section iv)** for the detailed outcome of the impact assessment process.

(II) AN ASSESSMENT OF THE SIGNIFICANCE OF EACH ISSUE AND RISK AND AN INDICATION OF THE EXTENT TO WHICH THE ISSUE COULD BE AVOIDED OR ADDRESSED BY THE ADOPTION OF MITIGATION MEASURES

See **Section iv)** for the detailed outcome of the impact assessment process.

**K) ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK**

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

**Table 50** provides the summary of potential significant impacts and risks associated with the proposed non-invasive prospecting right following the detailed impact assessment as provided in **Section iv)**.

Table 50: Summary of potentially significant impacts and risks

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Non-invasive prospecting	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a change in scope, the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the <u>change in scope</u> .	Agriculture and Soil	Desktop non-invasive Prospecting	2	No mitigation measures associated to the non-invasive prospecting proposed.  <b>However, should the scope change, the required amendment process as per NEMA 2014 EIA Regulations (as current and future amendments) must include the review of Part B – Environmental Management Programme Report.</b>	2
		Archaeological, Cultural, and Palaeontology				
		Terrestrial Biodiversity				
		Aquatic Biodiversity				
		Hydrology				
Noise						

In the event of considering the change in scope, the following:

- The site sensitivities as defined by the specialist desktop assessment and site verification (**Appendix C – Site Layout Plan, Sensitivities, and Land Use**), must be considered as potential “no-go” or “areas requiring further assessment”.
- The potential impacts and aspects identified in **Section iv)** requires to be assessed following a detailed impact assessment process.
- All management actions identified in Part B – Environmental Management Programme Report associated with considering a change in scope, must be implemented as part of the application process, defined by NEMA 2014 EIA Regulations (as amended), before considering an amendment to the issued EA.





## L) SUMMARY OF SPECIALIST REPORTS

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form)

**Table 51** provides the summary of the specialist desktop assessment and site sensitivity verification conducted as part of the application process for the proposed non-invasive prospecting right.

Table 51: Summary of specialist desktop and site sensitivity verification conducted

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Agricultural and Soil Assessment	Due to the non-invasive nature of the proposed prospecting right application, all specialists have determined that there is no impact or risk.		
Archaeological, Cultural and Palaeontological Assessment	<b>However, should the scope change of the non-invasive to be considered, it is concluded that further assessment of all aspects, deemed applicable by the independent EAP, are required.</b>		Recommendations have been incorporated throughout this document.
Terrestrial Biodiversity Assessment (including Plant and Animal species)		<b>X</b>	See the following specific sections:
Aquatic Biodiversity Assessment	From the desktop and site sensitivity verification, <b>Appendix C – Site Layout Plan, Sensitivities, and Land Use</b> provides defined areas that are potential “no-go” or “areas requiring further assessment”. Any other types of prospecting (i.e. intrusive of nature) in these areas should be avoided or limited pending the final impact assessment.		(1)(a); <b>and</b>
Hydrological flood-line determination			<b>iv)</b>
Noise Assessment			



## M) ENVIRONMENTAL IMPACT STATEMENT

In accordance with the Appendix 3 Section 3 (q) of the NEMA 2014 EIA Regulations (as amended), the EAP must provide an opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation must be stated (see **Section q**).

A desktop based, followed by a site sensitivity verification (**Appendix D – Site Sensitivity Verification**), impact assessment has been undertaken, which has incorporated consultation with appointed independent specialist, and resulted in this report.

No alternatives was considered (see **Sections g,h, and i**) due to the non-invasive nature of the proposed prospecting right application. However, verified sensitive areas were defined (**Appendix C – Site Layout Plan, Sensitivities, and Land Use**) and should be considered as potential “no-go” or “area requiring further investigation” should there be a planned change in scope. A change in scope from non-invasive will require that the relevant amendment process as per the NEMA 2014 EIA Regulations (as amended), be initiated to review the issued EA.

It is the EAP’s opinion that due process has been followed in terms of identifying potential impacts and or risks found to be potentially significant, and that should be further assessed if a change in scope is required.

It is recommended that the proposed **non-invasive prospecting** is allowed to proceed on the assumption that the environmental and social management commitments are adhered to, the scope of the prospecting remains as per the description provided in this document and considering the positive social impacts associated with the proposed prospecting right.

No intrusive prospecting activities shall continue without following the required EA amendment process as stipulated in the NEMA 2014 EIA regulations.

### i) SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Due to the **non-invasive** nature of the proposed prospecting right application, the EAP and all specialists have confirmed that there is ***no impact or risk***.

However, should the scope change of the non-invasive be considered, it is concluded that ***further assessment*** of all aspects, deemed applicable by the independent EAP, ***are required***.

From the desktop and site sensitivity verification, **Appendix C – Site Layout Plan, Sensitivities, and Land Use** provides defined areas that are potential “no-go” or “areas requiring further assessment”. Intrusive prospecting in these areas should be avoided or limited pending the final impact assessment. No intrusive prospecting activities shall continue without following the required EA amendment process as stipulated in the NEMA 2014 EIA regulations.



## ii) FINAL SITE MAP

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

Find **Appendix C – Site Layout Plan, Sensitivities, and Land Use.**

## iii) SUMMARY OF THE POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

Due to the non-invasive prospecting nature associated with the proposed prospecting right, and based on the desktop need and desirability assessment (**Section f**), the following positive and negative potential impacts are to be considered:

- **Potential Positive (s)** – although no physical job creation will result from the non-invasive prospecting, the potential job opportunities and much needed economic support to the local GDP associated with future mining, may alleviate to some extent poverty, crime, and the increasing unemployment rate observed throughout the district.
- **Potential Negative (s)** – although no activities or impacts have been defined by this assessment, the potential future mining within the proposed prospecting right area will have definite impact on the defined sensitivities. The significance thereof can only be determined following the required Scoping and Environmental Impact Assessment (S&EIA) as defined in the NEMA 2014 EIA Regulations. The potential impacts or risks defined in this assessment should however be used as the baseline determination to avoid, mitigate and manage the identified potential risks associated with future mining activities.

## N) PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

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

No specific impact management objectives and outcomes can be defined for the proposed non-invasive prospecting right application, as it has been highlighted throughout this report that there is no impact or risk defined.

However, from the desktop and site sensitivity verification (**Appendix D – Site Sensitivity Verification**) there is a potential of a number of predetermined potential impacts and risks (**Section iv**) identified should the applicant change the scope of this application process.

**Part B – Environmental Management Programme Report** provides mitigation and management measures that must be implemented prior to and during the required process to amend the issued EA in terms of the NEMA 2014 EIA Regulations.



## O) ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

*(Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation)*

Based on the outcome of this assessment and information informing the opinion of the independent EAP, it is recommended that the following conditions be specified and considered as conditions of the EA:

- The issued EA only relates to the proposed non-invasive prospecting activities. Should the holder of the authorisation (HoA), or the persons appointed to conduct the prospecting on behalf of the HoA, identify or plan the need for intrusive prospecting, an application for amending the scope of the EA in terms of the NEMA 2014 EIA Regulations (as amended) must be submitted.
- The identified sensitivities as provided in **Appendix C – Site Layout Plan, Sensitivities, and Land Use**, must be considered as potential “No-go” or “areas requiring further assessment”, pending a detailed impact assessment and management or mitigation implementation plan.
- The management and mitigation actions provided in Part B – Environmental Management Programme Report must be implemented prior to and during the required process to amend the issued EA in terms of the NEMA 2014 EIA Regulations.
- An independent suitably qualified Environmental Inspector, preferably a registered EAP, must be appointed by the HoA to inspect, confirm, and report any non-conformances with the EA and requirements of the EMPr on a quarterly basis. Records of these inspections must be kept and readily available to the relevant Environmental Management Inspectorate (EMI).
- Auditing of compliance with the EA and EMPr in terms of Part 3, Regulations 34 of the NEMA 2014 EIA Regulations (as amended) must be conducted on an annual basis. This audit to be conducted preferably by a independent registered EAP.

## P) DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

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

All conclusions and recommendations made in this report is based on information provided by the applicant. The independent EAP appointed various specialist to conduct a desktop assessment and site sensitivity verification. The outcome (provided as Appendix D – Site Sensitivity Verification) informed this BA process and was considered by the EAP as true and accurate.

It is clearly stated and concluded that the recommendations made, and opinion of the EAP is based on the fact that this application relates to non-invasive prospecting and should not be construed as an assessment of potential impacts and risks associated with any other form of prospecting activities. However, should the applicant require an amendment of the scope, preliminary potential impacts and risks requiring further assessment were identified based on the outcome of the sensitivity verification.

## Q) REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD BE AUTHORISED OR NOT

### i) REASONS WHY THE ACTIVITY SHOULD BE AUTHORISED OR NOT



Environmental Management Assistance (Pty) Ltd as the appointed EAP and associated Specialist recommends that on the conditions that all the requirements, conditions, and measures listed in this document and associated appendices be adhered to, that there is no reason why this activity should not be authorised.

Due to the ***non-invasive*** nature of the proposed prospecting right application, the EAP and all specialists have confirmed that there is ***no impact or risk***.

However, should the scope change be considered, it is concluded that ***further assessment*** of all aspects, deemed applicable by the independent EAP, ***are required***.

From the desktop and site sensitivity verification, ***Appendix C – Site Layout Plan, Sensitivities, and Land Use*** provides defined areas that are potential “no-go” or “areas requiring further assessment”. Intrusive prospecting in these areas should be avoided or limited pending the final impact assessment. No intrusive prospecting activities shall continue without following the required EA amendment process as stipulated in the NEMA 2014 EIA regulations.

## ii) CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

It is recommended that the conditions listed for consideration in ***Section o)*** be included in the authorisation.

It must be clearly stated that no intrusive prospecting activities shall continue without following the required EA amendment process as stipulated in the NEMA 2014 EIA regulations.

## R) PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The proposed non-invasive prospecting is planned over a total of five (5) years. In terms of Section 18 (4) of the Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002), following the acceptance of the application for renewal, the prospecting right may be renewed once for a period not exceeding three years.

## S) UNDERTAKING

*(Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Basic assessment report and the Environmental Management Programme report.)*

See Part B of this report and ***Appendix G – EAP Undertaking***.

## T) FINANCIAL PROVISION

*(State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.)*

Due to the proposed non-invasive prospecting activities, a cost determination to manage and rehabilitate is not relevant to this application.



However, should there be a change in scope, the HoA must determine the financial provisioning in line with GNR. 1147 (GG 39425 dated 20 November 2015, as amended) and submit the required reports as part of the NEMA 2014 EIA Regulations amendment process.

**i) EXPLAIN HOW THE AFORESAID AMOUNT WAS DERIVED**

Not required due to the non-invasive nature of this prospecting right application process.

**ii) CONFIRM THAT THIS AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE**

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

Not required due to the non-invasive nature of this prospecting right application process.

**U) SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

At the time finalising this report, no specific information was required by the competent authority.

**i) COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24 (4) (A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998). THE EIA REPORT MUST INCLUDE THE:-**

Section 24 (4)(a) and (b) of NEMA states the following:

*“Procedures for the investigation, assessment and communication of the potential consequences or impacts of the activities on the environment – (a) must ensure, with respect to every application for an environmental authorisation –*

- (i) Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;*
  - (ii) that the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in section 2 are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, process, plan or project;*
  - (iii) that a description of the environment likely to be significantly affected by the proposed activity is contained in such application;*
  - (iv) investigation of the potential consequences for or impacts on the environment of the activity and assessment of the significance of those potential consequences or impacts; and*
  - (v) public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures; and*
- (b) must include, with respect to every application for an environmental authorisation and where applicable –*



- (i) investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity;
- (ii) investigation of mitigation measures to keep adverse consequences or impacts to a minimum;
- (iii) investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;
- (iv) reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;
- (v) investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation;
- (vi) consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3); and
- (vii) provision for the adherence to requirements that are prescribed in a specific environmental management Act relevant to the listed or specified activity in question.”

Section 24 (3)(a) and (7) of NEMA states the following:

“24 (3) The Minister, or an MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority.”

“24 (7) Compliance with the procedures laid down by the Minister or an MEC in terms of subsection (4) does not absolve a person from complying with any other statutory requirement to obtain authorization from any organ of state charged by law with authorising, permitting or otherwise allowing the implementation of the activity in question.”

The purpose of Part A and Part B of this report fulfils the requirements stipulated in section 24 of NEMA.

#### **(1) IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON**

*(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report an Appendix)*

**Section f)** of this report provides the need and desirability assessment, and an overview of the socio-economic context of the proposed non-invasive prospecting.

#### **(2) IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3 (2) OF THE NATIONAL HERITAGE RESOURCES ACT**



*(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein)*

See **Section (1) (a) III** and **Appendix F.2 – Archaeological, Cultural, and Palaeontology**.

## **V) OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24 (40 (A) AND (B) OF THE ACT**

*(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).*

See **Sections g), h), and i)**.





## PART B – ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### 2. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

The purpose of this section is to provide a baseline Environmental Management Programme (EMPr).

Globally, there are a number of tools or guideline documents available to assist or describe environmental management. The purpose of an EMPr is to describe the process of managing the identified potential environmental impacts or risks identified during the BA process throughout the entire life cycle (from planning and design, to implementation, operation, and Closure) of any proposed development.

During the development of this EMPr, the EAP took an integrated environmental management approach by adopting, in addition to the legislative requirements, the principles set out in the internationally recognised ISO 14001 Environmental Management System (EMS) standard.

The ISO 14001 EMS rationale is essentially based on the Deming Cycle which is a simplified continuous improvement model consisting of four main iterative steps.

These steps are described as follows:

- Plan – Establish objectives and processes necessary to deliver results in accordance with the developed organisational environmental policy.
- Do – Implement the process.
- Check – Monitor and measure processes against environmental policy, objectives, legal and other requirements and report the results.
- Act – Take action to continually improve environmental performance.

In addition to the ISO 14001 EMS standard, the Environmental and Social Performance Requirements as defined by the International Finance Corporation (IFC) was considered throughout the development of this EMPr.

Continual improvement is achieved by periodically monitoring and reviewing the EMPr, subsequently implementing corrective actions when required.

As discussed throughout **PART A – Scope of Basic Assessment Report**, it is not anticipated that the non-invasive prospecting right will have a impact from an environmental and socio-economic perspective. No specific impact management objectives and outcomes can be defined for the proposed non-invasive prospecting right application.

However, from the desktop and site sensitivity verification (**Appendix D – Site Sensitivity Verification**) there is a potential of a number of predetermined potential impacts and risks (**PART A – Scope of Basic Assessment Report ,Section iv**) identified should the applicant change the scope of this application process.

This section will provide mitigation and management measures that must be implemented prior to and during the required process to amend the issued EA in terms of the NEMA 2014 EIA Regulations.



Part B of this report should be considered as a “living” document, to be reviewed and amended as deemed necessary.

The reasons for review and/or amendments may be the following:

- Change in scope;
- Detailed assessment of risks or impacts associated with a change in the nature of non-invasive prospecting; and
- The ability of the EMPr and/or specific mitigation measures to sufficiently provide for the avoidance, management, and mitigation of environmental impacts associated with the undertaking of authorised activities.

This EMPr is only applicable to the listed authorising activities as stipulated **PART A – Scope of Basic Assessment Report, Section d) i)**, excluding intrusive prospecting activities.

## W) DETAILS OF THE EAP

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

As stipulated in **PART A – Scope of Basic Assessment Report, Section 1 a) i)**.

## X) DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

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

As stipulated in **PART A – Scope of Basic Assessment Report, Section d)**.

## Y) COMPOSITE MAP

*(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)*

See **Appendix C – Site Layout Plan, Sensitivities, and Land Use**.

## Z) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

Although it is anticipated that the non-invasive prospecting activities will have no impacts, a number of possible environmental and social impacts/risks have been identified that will required further assessment should there be a change in scope.

The sections to follow will provide the management and mitigation approach that will be required to be implemented by the HoA, or any persons appointed by the HoA to conduct or implement the change in scope, before and during the application process for amending the EA.

### i) DETERMINATION OF CLOSURE OBJECTIVES

*(Ensure that the closure objectives are informed by the type of environment described.)*



Since no physical activities are related to the proposed non-invasive prospecting, should a change in scope be considered by the HoA, closure objectives will be required to be defined in detail.

These objectives to include, but not limited to, the following:

- **Physical stability:** Removing and/or stabilising the impacts surface areas in order to facilitate the defined end land use.
- **Environmental quality:** To ensure that local environmental quality is not adversely affected by possible physical impacts and contamination which may be arising from the rehabilitated areas.
- **Health and Safety:** To limit the possible health and safety threats to humans and animal by securing the impacted surface area.
- **Land capability / end land use:** To re-instate suitable land capabilities over the rehabilitated portions of impacted surface areas.
- **Aesthetic quality:** To leave behind a rehabilitated site that, in general, that is acceptable to the affected communities in aesthetic appearance.
- **Biodiversity:** To encourage, where appropriate, the re-establishment of native vegetation on the rehabilitated surface areas.
- **Social:** To ensure that measures and/ or contributions made during prospecting towards the long-term socio-economic benefit of the local communities are sustainable.

**Table 52** provides the general objectives that must be considered when developing the required Closure Plan in line with GN.R. 1147 (as amended).

Table 52: General objectives that must be considered

ASPECT	OBJECTIVE	PERFORMANCE INDICATOR	MONITORING MECHANISM
<b>Physical stability</b>	To remove and/or stabilise surface infrastructure.	<ul style="list-style-type: none"> <li>• All rehabilitated disturbed areas that have the potential for wind and/or water erosion will be provided with a suitable vegetation cover to combat these aspects/forces;</li> <li>• Where localised material deficits occur, voids will be backfilled and shaped as pan like or naturally undulating structures so that beneficial land uses can be implemented; and</li> <li>• Monitoring is undertaken to demonstrate the success of the closure and rehabilitation measures implemented.</li> </ul>	<ul style="list-style-type: none"> <li>• Auditing and reporting as specified in section 6.</li> <li>• Implementation of the monitoring programme (<b>Table 56</b>).</li> </ul>
<b>Environmental quality</b>	To ensure that local environmental quality is not adversely affected by possible physical impacts and contamination which may be arising from the rehabilitated areas.	<ul style="list-style-type: none"> <li>• No environmental risks will remain post-closure.</li> <li>• Environmental impacts will be investigated and addressed at source. If not addressed at the source, the required intervention/mitigation measures will be implemented, preferably during operations, to limit the intervention required at closure; and</li> </ul>	



		<ul style="list-style-type: none"> <li>Ongoing monitoring will be undertaken to ensure the quality of the surface and groundwater remains within pre-mining quality ranges or at such quality that it suitably protects receptors.</li> </ul>	
<b>Land capability/land-use</b>	To re-instate suitable land capabilities over the rehabilitated portions.	<ul style="list-style-type: none"> <li>Where possible, land capability will be reinstated to match the pre-development land capabilities;</li> <li>A functional post-development landscape is achieved inline with current zoning;</li> <li>Invasive vegetation species will be eradicated to further enable achievement of the desired land capability on rehabilitated areas, and functioning of riparian zones; and</li> <li>Landforms are mostly free draining to maximise the surface water return into the catchment to reduce recharge and ensure connectivity of wetlands and functioning of riparian zones.</li> </ul>	
<b>Biodiversity</b>	To encourage, where appropriate (for example in corridors), the re-establishment of native vegetation on the rehabilitated areas such that the potentially affected terrestrial and or aquatic biodiversity is largely re-instated over time.	<ul style="list-style-type: none"> <li><sup>25</sup>Self-sustaining vegetation communities are established; and</li> <li>Invasive species that could threaten the reinstatement of the desired vegetation communities are actively eradicated.</li> </ul>	
<b>Social</b>	To ensure that the infrastructure transfers (if any), and measures and/or contributions made towards the long-term socio-economic benefit of the local communities are sustainable.	<ul style="list-style-type: none"> <li>The local communities are adequately informed about closure (next land use planning, scheduled closure and re-skilling initiatives linked to the next land use, where possible);</li> <li>Obsolete/dormant infrastructure that could be beneficially reused is identified and re-used; and</li> <li>Communities scheduled to benefit are empowered to take over and maintain relinquished infrastructure for their ongoing benefit.</li> </ul>	

## ii) VOLUMES AND RATE OF WATER USE REQUIRED FOR THE OPERATION

No water or water uses are related to the non-invasive prospecting right.

<sup>25</sup> Able to continue in a healthy state, i.e. pre-development land capability, without interventions such as herbicide, water, and fertilizer applications, etc.



**iii) HAS A WATER USE LICENCE HAS BEEN APPLIED FOR?**

A Water Use Licence (WUL) is not required for the non-invasive prospecting right.

However, should the change in scope be relevant, the need for a WUL must be reassessed as part of the amendment process.



iv) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

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

Table 53 provides for the identified measures to manage potential impacts associated with the non-invasive prospecting.

Table 53: Identified measures to manage the potential impacts associated with the proposed non-invasive and considerations to change the scope

ACTIVITIES (as listed in 2.11.1)	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m <sup>2</sup> )	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION
<b>Non-invasive Prospecting</b>	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the proposed scope change (i.e. intrusive prospecting), and identify all management and mitigation measures. During the Planning Phase for the change in scope, the following must be implemented prior to and during the amendment process:					
The following general management measures must be considered by the HoA in the event of a change in scope (i.e. intrusive prospecting):						
<ol style="list-style-type: none"> <li>Prior to the commencement of any scope change, the HoA must appoint a Registered EAP to initiate the required amendment of the EA process in line with the NEMA 2014 EIA Regulations (as amended).</li> <li>The final site layout should consider all sensitivities verified in the Site Sensitivity Verification Report (SSVR).</li> <li>All planning and pre-construction activities to take place under the supervision of a suitably qualified and experienced environmental representative.</li> <li>An Environmental Control Officer (ECO), with appropriate experience and qualifications in the implementation of environmental management specifications, must be appointed prior to the commencement of any intrusive prospecting activities.</li> <li>A pre-construction site walkabout must be conducted by the ECO and HoA (or appointed responsible person), recording the pre-construction land-use and status</li> <li>Utilise existing infrastructure where possible, e.g existing access roads to minimize environmental impacts.</li> <li>The HoA has the responsibility to notify the competent authority of any alienation, transfer and, change of ownership rights in the property on which the activity is to take place.</li> </ol>						
AGRICULTURE AND SOIL						
	<b>Loss of agricultural land</b> <b>Erosion formation and soil pollution</b>	Planning Phase	To be determined	<ol style="list-style-type: none"> <li>A suitably qualified specialist to be appointed to conduct the required assessment of the areas that will be affected by the proposed intrusive prospecting activities in line with the relevant protocols.</li> <li>The final site layout should consider all sensitivities verified in the Site Sensitivity Verification Report (SSVR).</li> <li>A site clearance schedule must be developed to ensure that no unvegetated areas are left exposed for an extended period. Site clearance to be kept to a minimum.</li> <li>An area to be identified prior to the commencement of construction for the stockpiling of topsoil. A calculation of required topsoil required for rehabilitation to be determined prior to the commencement of activities. The area demarcated for the stockpiling of topsoil should be sufficiently sized. Measures to prevent erosion and manage storm water of these stockpiles must be considered prior to stripping of topsoil.</li> </ol>	<ol style="list-style-type: none"> <li>Ensure compliance with the applicable assessment protocol (GN. 320 GG 4310 dated 20 March 2020)</li> <li>Ensure compliance with the Conservation of Agricultural Resources Act (CARA), Act 43 of 1983.</li> <li>Development of a soil conservation management plan.</li> <li>Development of a soil conservation management plan.</li> <li>Development of a storm water management plan.</li> <li>Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.</li> <li>Development of a soil conservation management plan.</li> </ol>	Prior to and during the EA amendment process.
ARCHAEOLOGY, CULTURAL, AND PALAEOLOGY						
<b>Considerations in the event of a change in Scope</b>	<b>Loss of heritage and cultural resources</b>	Planning Phase	To be determined	<ol style="list-style-type: none"> <li>A suitably qualified specialist to be appointed to conduct a detailed site assessment of potential heritage features within the define site plans associated with the proposed intrusive prospecting activities.</li> <li>All heritage features identified in the SSVR and initial BAR must be clearly demarcated prior to the commencement of intrusive prospecting. The appointed ECO must form part of the site inspection identifying these features and record its status and condition.</li> <li>If during the initial site inspection possible heritage features not identified in the SSVR or BAR are found, the site layout plan must be updated accordingly before commencement of prospecting.</li> <li>Prior to the commencement of intrusive prospecting activities, a suitably qualified archaeologist must be appointed to lead the further surface sampling and excavation in the event of identifying features not listed in the SSVR and BAR.</li> <li>Appropriate permits for the surface sampling and excavation must be obtained by the appointed archaeologist as required in the National Heritage Resources Act (Act 25 of 1999).</li> <li>All finds must be recorded on the archaeological record of the area.</li> </ol>	<ol style="list-style-type: none"> <li>Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999.</li> </ol>	Prior to and during the EA amendment process.
TERRESTRIAL BIODIVERSITY						
	<b>Degradation of terrestrial biodiversity</b>	Planning Phase	To be determined	<ol style="list-style-type: none"> <li>A suitably qualified specialist to be appointed to conduct the required Terrestrial Biodiversity Assessment (inclusive of plant and animal species) in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</li> <li>Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.</li> <li>Before the commencement of intrusive prospecting activities, the area for development should be clearly demarcated to restrict activities within the development footprint.</li> <li>Prior to any intrusive prospecting activities, the ECO (if suitably qualified) or appointed specialist (preferably SACNASP registered specialising in the field of ecology), must conduct a site inspection recording all potential protected or endangered fauna and flora species. A detailed register should be kept of these species indicating at least its location, condition and potential of relocation.</li> <li>Provincially protected (including species of conservational concern) must be marked for rescue and relocation, or removal (where permit application would then apply) before any vegetation removal commences.</li> <li>Obtain any additional environmental permits required from the relevant competent authority for the protected plant species that need to be translocated through the search and rescue exercise.</li> </ol>	<ol style="list-style-type: none"> <li>Conduct the required Terrestrial Biodiversity Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</li> <li>Develop and implement a pre-intrusive prospecting management plan.</li> <li>Apply for permits to remove protected species (provincial and national).</li> <li>Obtaining any other licences, permits or authorisations as required by provincial or national legislation for the removal of protected species.</li> <li>Develop a plant species search and rescue management plan.</li> <li>Maintain and implement the existing ion Smelter's alien invasive</li> </ol>	Prior to and during the EA amendment process.



			<p>7. Alien invasive species, that were identified within the study area, should be removed from the prospecting footprint and immediate surrounds, prior to soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. No chemical control may be used without the supervision of a certified professional (Pest Control Operator).</p> <p>8. Prior to commencement of intrusive prospecting all supervisors of the vegetation clearing, including contractors must receive adequate training as to the presence, identity, and management of species of conservation importance.</p>	eradication and control management plan.	
AQUATIC BIODIVERSITY					
<p><u>Loss of aquatic biodiversity/ Direct Loss of Wetland Features</u></p> <p><u>Erosion and sedimentation of Wetlands</u></p> <p><u>Water Quality Deterioration/Contamination of Water Resource</u></p> <p><u>Invasive alien plant encroachment</u></p>	Planning Phase	To be determined	<p>1. A suitably qualified specialist to be appointed to conduct the required Aquatic Biodiversity Assessment (inclusive of a wetland delineation assessment) in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</p> <p>2. Intrusive prospecting activities must avoid the defined sensitivities identified in the SSVR and BAR.</p> <p>3. Prior to intrusive prospecting activities, a site inspection must be conducted by the ECO to identifying potential drainage lines feeding into the defined riparian zones or wetlands.</p>	<p>1. Conduct the required Aquatic Biodiversity Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</p> <p>2. Ensure compliance with the National Water Act (NWA), Act 36 of 1996 and related regulations.</p> <p>3. Implementation of a storm water management plan.</p>	Prior to and during the EA amendment process.
SURFACE WATER RESOURCE					
<p><u>Degradation of natural water resources/Water resource contamination</u></p> <p><i>All potential impacts/risks identified under the "Aquatic Biodiversity" section directly or indirectly relates to surface and groundwater resources and should also be taken into consideration.</i></p>	Planning Phase	To be determined	<p>1. A suitably qualified hydrologist (preferably SACNASP registered) must be appointed to develop a conceptual Storm Water Management Plan (SWMP).</p> <p>2. The conceptual storm water management plan must be considered in the final detailed design before commencing of any intrusive prospecting activities.</p> <p>3. Intrusive prospecting planning should prioritise the implementation measures to be taken, i.e. constructing of storm water infrastructure around the perimeter of the site, to prevent sedimentation and erosion during prospecting activities.</p>	<p>1. Ensure compliance with the National Water Act (NWA), Act 36 of 1996 and related regulations.</p> <p>2. Implementation of a storm water management plan.</p>	Prior to and during the EA amendment process.
NOISE					
<u>Noise generation</u>	Planning Phase	To be determined	<p>1. A suitably qualified specialist to be appointed to conduct the required Noise Impact Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020).</p> <p>2. The final site layout plan of the proposed intrusive prospecting activities must take into consideration the noise sensitive receptors identified in the SSVR and BAR.</p>	<p>1. Conduct the required Noise Impact Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020).</p> <p>2. Compliance with Noise Control Regulations promulgated under the Environment Conservation Act, (Act No. 73 of 1989), Government Gazette No. 15423, 14 January 1994.</p>	Prior to and during the EA amendment process.
AIR QUALITY					
<u>Degradation of air quality</u>	Planning Phase	To be determined	<p>1. Depending on the type of intrusive activity, i.e. bulk sampling, trenching or core drilling, a baseline assessment will be required to determine if the potential impacts/risks that may affect the surrounding air quality.</p>	<p>1. Development and implementation of a Dust management plan.</p> <p>2. Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014.</p> <p>3. Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009).</p> <p>4. Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013).</p>	Prior to and during the EA amendment process.
WASTE MANAGEMENT					
<u>Waste Generation</u>	Planning Phase	To be determined	<p>1. All waste streams associated with intrusive prospecting activities must be defined. Based on the identified waste streams, a Waste Management Plan must be developed.</p>	<p>1. Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.</p>	Prior to and during the EA amendment process.
SOCIO-ECONOMIC					
<p><u>Socio-economic intrusions</u></p> <p><u>Job opportunities and economic impacts</u></p> <p><u>Population change</u></p> <p><u>Sense of place</u></p> <p><u>Community safety Risks</u></p> <p><u>Resource efficiency and community health</u></p> <p><u>Loss of permanent jobs</u></p> <p><u>Gender Equality</u></p>	Planning Phase	To be determined	<p>1. The socio-economic contribution related to intrusive prospecting activities must be further assessed in line with the "Needs and Desirability" questionnaire as per <b>Table 6: Questions indicated how the proposed development justified economic and social development in Part A Section f).</b></p>	<p>1. Adherence with the approved EMP.</p> <p>2. Adherence with the developed Safety, Health Environmental and Quality system.</p> <p>3. Adherence with the developed procurement and employment policy.</p> <p>4. Adherence to a developed grievance procedure.</p> <p>5. Adherence to a Gender Mitigation Framework (in line with the IFC and World Bank Standards).</p>	Prior to and during the EA amendment process.



**AA) IMPACT MANAGEMENT OUTCOMES**

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

**Table 54** provides the description of the impact management outcomes associated with the proposed non-invasive prospecting right.

Table 54: Description of impact management outcomes

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE (modify, remedy, control, or stop)	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.	
					Objective	Target
<b>Non-invasive Prospecting</b>	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the proposed scope change (i.e. intrusive prospecting), and identify all management and mitigation measures. During the Planning Phase for the change in scope, the following objectives and targets must be further assessed:					
<b>Considerations in the event of a change in Scope</b>	AGRICULTURE AND SOIL					
	<u>Loss of agricultural land</u> <u>Erosion formation and soil pollution</u>	Agriculture and Soil	Planning Phase	Avoid/Remedy	1. Soil conservation throughout all phases of the intrusive prospecting activities. 2. Adequate protection of soil resources and remediation if degradation cannot be avoided. 3. To prevent any erosion and to provide adequate erosion control measures where required.	1. No visible signs of erosion formations such as dongas or rills. 2. Sedimentation loads (measured in Total Dissolved Solids) of streams and rivers not to exceed the regulated Resource Water Quality Objectives of the local catchment. 3. Erosion control measures implemented in high-risk areas.
	ARCHAEOLOGY, CULTURAL, AND PALAEOLOGY					
	<u>Loss of heritage and cultural resources</u>	Heritage and Culture	Planni ng Phase	Avoid	1. Identification of all possible sites of archaeological value and graves prior to the commencement of authorised work.	1. Evidence of records should further discoveries be identified during construction.
	TERRESTRIAL BIODIVERSITY					
	<u>Degradation of terrestrial biodiversity</u>	Terrestrial Biodiversity	Planning Phase	Avoid/Control	1. Avoid the unnecessary expansion of the intrusive prospecting footprint. 2. Obtaining any other licences, permits or authorisations as required by provincial or national legislation for the removal of protected species. 3. Develop a plant species search and rescue management plan. 4. Maintain and implement a alien invasive eradication and control management plan. 5. Prevent any veldt fires or chemical fires. 6. Effective vegetation management along the perimeter of the intrusive prospecting footprint. 7. Maintaining the required firebreak associated with the intrusive prospecting footprint. 8. Continuous management of alien and invasive species within the prospecting footprint. 9. Conservation of fauna and Flora species. 10. Effectively re-vegetate all disturbed areas intrusive prospecting activities. 11. Ensure the effective management of alien invasive species post-closure.	1. No activities outside of the preferred site layout plan. 2. No non-compliances recorded in terms of the required environmental authorisations or licences. 3. No unauthorised removal of protected species. 4. Contain and control the spreading of alien and invasive species within the intrusive prospecting footprint. 5. No veldt fires or chemical fires originating from the prospecting activities. 6. No areas left unvegetated post-closure. 7. Contain and control the spreading of alien and invasive species within the intrusive prospecting footprint. 8. Habitat reinstatement of fauna and flora species disturbed by the prospecting activities.
	AQUATIC BIODIVERSITY					
	<u>Loss of aquatic biodiversity/ Direct Loss of Wetland Features</u> <u>Erosion and sedimentation of Wetlands</u> <u>Water Quality Deterioration/Contamination of Water Resource</u> <u>Invasive alien plant encroachment</u>	Aquatic Biodiversity and Wetland Features	Planning Phase	Avoid/Mitigate	1. Avoid development within the regulated zones from the identified riparian zones or identified wetlands. 2. Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation. 3. Remedy the possible effects of alteration to natural drainage lines. 4. Avoid the destruction of wetlands. 5. Avoid the release of pollutants into the aquatic environment. 6. Wastewater is appropriately managed. 7. Erosion is prevented.	1. Ensure water quality results falls within the regulated Resource Water Quality Objectives for the relevant catchment. 2. Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. 3. No incidents related to the pollution of rivers and streams. 4. No visible signs of erosion formations such as dongas or rills. 5. Erosion control measures implemented in high-risk areas. 6. No signs of degradation of diversion channels or drainage systems. 7. No evidence of pollutants released into streams and rivers. 8. No evidence of hydrocarbon and hazardous spills. 9. Immediate removal and remediation of all spills.
	SURFACE WATER RESOURCE					
	<u>Degradation of natural water resources/Water resource contamination</u> <i>All potential impacts/risks identified under the "Aquatic Biodiversity" section directly or indirectly relates to surface and groundwater resources and should also be taken into consideration.</i>	Surface Water Resources	Planning Phase	Avoid/Control	1. Ensuring effective storm water management activities takes place during all phases of the development. 2. Avoid intrusive prospecting within the regulated zones or within the 1:100-year flood line. 3. Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation. 4. Remedy the possible effects of alteration to natural drainage lines. 5. Avoid the destruction of wetlands. 6. Avoid the release of pollutants into the aquatic environment. 7. Wastewater is appropriately managed. 8. Erosion is prevented.	1. Ensure water quality results falls within the regulated Resource Water Quality Objectives for the relevant catchment. 2. Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. 3. No incidents related to the pollution of rivers and streams. 4. No visible signs of erosion formations such as dongas or rills. 5. Erosion control measures implemented in high-risk areas. 6. No signs of degradation of diversion channels or drainage systems. 7. No evidence of pollutants released into streams and rivers. 8. No evidence of hydrocarbon and hazardous spills. 9. Immediate removal and remediation of all spills.
	NOISE					
	<u>Noise generation</u>	Surrounding environmental noise quality	Planning Phase	Control	1. Ensure effective noise control measures are implemented during intrusive prospecting activities.	1. Not exceeding the determined baseline dBA threshold. 2. No noise complaints received from surrounding community members.
	AIR QUALITY					
	<u>Degradation of air quality</u>	Air Quality	Planning Phase	Control	1. Ensuring compliance with the National Dust Control regulations.	1. No complaints from site staff, surrounding landowners and communities. 2. Adherence with legal required dust fallout levels.
WASTE MANAGEMENT						
<u>Waste Generation</u>	Waste Management	Planning Phase	Control	1. Promoting the reduction, re-use, or recycle of waste where prevention is not possible. 2. Disposal of waste to local waste disposal sites is limited.	1. No littering. 2. No unpleasant odours. 3. Marked and sealable bins observed. 4. Evidence of waste disposal certificates.	
SOCIO-ECONOMIC						
<u>Socio-economic intrusions</u> <u>Job opportunities and economic impacts</u> <u>Population change</u> <u>Sense of place</u> <u>Community safety Risks</u>	Socio- economic	Planning Phase	Control	1. Limit socio-economic intrusions. 2. Enhance job opportunities and local procurement. 3. Limit negative impacts associated with population change. 4. Minimise impacts on local community safety. 5. Limit dependency on the grid while lowering operational costs. 6. Positive long-term impacts on local and regional economy as a result of continuation of intrusive prospecting and or mining with subsequent	1. Minimum community complaints related to traffic and road infrastructure. 2. Limited complaints from local community related to nuisance factors. 3. Air quality levels to meet relevant standards and implementation of Air Quality Management Plan. 4. Noise levels within limits as specified in noise standards. 5. No community protests directed at the project. 6. Meet provincial employment and procurement targets.	





<u>Resource efficiency and community health</u>				indirect employment opportunities and downstream economic opportunities.	7. Local labour (low skilled) forms a considerable percentage (where lower skills apply) of labour force.
<u>Loss of permanent jobs</u>				7. Manage the impact of the prospecting activities and future mining on gender equality and gender based violence.	8. Local procurement is implemented where feasible and available.
<u>Gender Equality</u>					9. Zero accidents or safety incidents.
					10. EMP compliance.
					11. Compliance to relevant Health And Safety regulations and standards.
					12. Capacity building and skills training over the operational period of the facility.
					13. Employees with portable skills.
					14. No complaints with regards to intrusion impacts during Closure phase.
					15. Compliance to the Gender Management Framework.

**BB) IMPACTS 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).

**Table 55** provides the identified impact management actions associated with the proposed non-invasive prospecting right.

Table 55: Identified impact management actions

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS  (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
<b>Non-invasive Prospecting</b>	No activities are anticipated with the proposed non-invasive prospecting rights. However, should there be a <b>change in scope</b> , the process stipulated by the NEMA 2014 EIA Regulations for amending the EA, must <b>further assess</b> the <b>potential impacts</b> associated with the proposed scope change (i.e. intrusive prospecting), and identify all management and mitigation measures. During the Planning Phase for the change in scope, the following must be considered:			
	AGRICULTURE AND SOIL			
	<u>Loss of agricultural land</u> <u>Erosion formation and soil pollution</u>	Avoid/Remedy	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Ensure compliance with the applicable assessment protocol (GN. 320 GG 4310 dated 20 March 2020)</li> <li>2. Ensure compliance with the Conservation of Agricultural Resources Act (CARA), Act 43 of 1983.</li> <li>3. Development of a soil conservation management plan.</li> <li>4. Development of a soil conservation management plan.</li> <li>5. Development of a storm water management plan.</li> <li>6. Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.</li> <li>7. Development of a soil conservation management plan.</li> </ol>
	ARCHAEOLOGY, CULTURAL, AND PALAEOLOGY			
	<u>Loss of heritage and cultural resources</u>	Avoid	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999.</li> </ol>
	TERRESTRIAL BIODIVERSITY			
	<u>Degradation of terrestrial biodiversity</u>	Avoid/Control	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Conduct the required Terrestrial Biodiversity Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</li> <li>2. Develop and implement a pre-intrusive prospecting management plan.</li> <li>3. Apply for permits to remove protected species (provincial and national).</li> <li>4. Obtaining any other licences, permits or authorisations as required by provincial or national legislation for the removal of protected species.</li> <li>5. Develop a plant species search and rescue management plan.</li> <li>6. Maintain and implement the existing ion Smelter's alien invasive eradication and control management plan.</li> </ol>
	AQUATIC BIODIVERSITY			
Considerations in the event of a change in Scope	<u>Loss of aquatic biodiversity/ Direct Loss of Wetland Features</u> <u>Erosion and sedimentation of Wetlands</u> <u>Water Quality Deterioration/Contamination of Water Resource</u> <u>Invasive alien plant encroachment</u>	Avoid/Mitigate	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Conduct the required Aquatic Biodiversity Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020 and GN. 1150 GG 43855 dated 30 October 2020).</li> <li>2. Ensure compliance with the National Water Act (NWA), Act 36 of 1996 and related regulations.</li> <li>3. Implementation of a storm water management plan.</li> </ol>
	SURFACE WATER RESOURCE			
	<u>Degradation of natural water resources/Water resource contamination</u>  <i>All potential impacts/risks identified under the "Aquatic Biodiversity" section directly or indirectly relates to surface and groundwater resources and should also be taken into consideration.</i>	Avoid/Control	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Ensure compliance with the National Water Act (NWA), Act 36 of 1996 and related regulations.</li> <li>2. Implementation of a storm water management plan.</li> </ol>
	NOISE			
	<u>Noise generation</u>	Control	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Conduct the required Noise Impact Assessment in line with the relevant protocols (GN. 320 GG 43110 dated 20 March 2020).</li> <li>2. Compliance with Noise Control Regulations promulgated under the Environment Conservation Act, (Act No. 73 of 1989), Government Gazette No. 15423, 14 January 1994.</li> </ol>
	AIR QUALITY			
	<u>Degradation of air quality</u>	Control	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Development and implementation of a Dust management plan.</li> <li>2. Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014.</li> <li>3. Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009).</li> <li>4. Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013).</li> </ol>
	WASTE MANAGEMENT			
	<u>Waste Generation</u>	Control	Prior to and during the EA amendment process.	<ol style="list-style-type: none"> <li>1. Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.</li> </ol>



SOCIO-ECONOMIC			
<u>Socio-economic intrusions</u> <u>Job opportunities and economic impacts</u> <u>Population change</u> <u>Sense of place</u> <u>Community safety Risks</u> <u>Resource efficiency and community health</u> <u>Loss of permanent jobs</u> <u>Gender Equality</u>	<p><b>Control</b></p>	<p>Prior to and during the EA amendment process.</p>	<ol style="list-style-type: none"> <li>1. Adherence with the approved EMPr.</li> <li>2. Adherence with the developed Safety, Health Environmental and Quality system.</li> <li>3. Adherence with the developed procurement and employment policy.</li> <li>4. Adherence to a developed grievance procedure.</li> <li>5. Adherence to a Gender Mitigation Framework (in line with the IFC and World Bank Standards).</li> </ol>



## v) FINANCIAL PROVISION

Due to the proposed non-invasive prospecting activities, a cost determination to manage and rehabilitate is not relevant to this application.

However, should there be a change in scope from non-invasive prospecting to intrusive prospecting, the HoA must determine the financial provisioning in line with GNR. 1147 (GG 39425 dated 20 November 2015, as amended) and submit the required reports as part of the NEMA 2014 EIA Regulations amendment process.

### (1) DETERMINATION OF THE AMOUNT OF FINANCIAL PROVISION

Not determined due to non-invasive prospecting right.

#### **(e) DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION**

See **Section z) i)**.

#### **(f) CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES**

This document and all information informing it will be subjected to the required Public Participation Process.

See **Sections ii) and iii) of PART A – Scope of Basic Assessment Report.**

#### **(g) PROVIDE A REHABILITATION PLAN THAT DESCRIBES AND SHOWS THE SCALE AND AERIAL EXTEND**

No disturbance associated with the proposed non-invasive prospecting right.

#### **(h) EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES**

Not required due to the non-invasive nature of this prospecting right application process.

#### **(i) CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT IN ACCORDANCE WITH THE APPLICABLE GUIDELINE**

Not determined due to non-invasive prospecting right.

#### **(j) CONFIRM THAT THE FINANCIAL PROVISION WILL BE PROVIDED AS DETERMINED**

Not required due to the non-invasive nature of this prospecting right application process.



## MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING

CC) MONITORING OF IMPACT MANAGEMENT ACTIONS

DD) MONITORING AND REPORTING FREQUENCY

EE) RESPONSIBLE PERSON]

FF) TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

GG) MECHANISM FOR MONITORING COMPLIANCE

**Table 56** provides the mechanism for monitoring compliance with and performance assessment against the EMPr and reporting thereon.

Table 56: 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
Non-invasive Prospecting	No impacts identified	<p>The following monitoring requirements must be implemented:</p> <ul style="list-style-type: none"> <li>Although no physical activities is associated with the proposed non-invasive prospecting, the HoA must appoint an independent suitably qualified Environmental Inspector (EI), preferably a registered EAP, must be appointed by the HoA to inspect, confirm, and report any non-conformances with the EA and requirements of the EMPr on a quarterly basis. Records of these inspections must be kept and readily available to the relevant Environmental Management Inspectorate (EMI).</li> <li>Auditing of compliance with the EA and EMPr in terms of Part 3, Regulations 34 of the NEMA 2014 EIA Regulations (as amended) must be conducted on an annual basis. This audit to be conducted preferably by a independent registered EAP.</li> </ul>	Appointed EI; Appointed EAP; and HoA.	<ol style="list-style-type: none"> <li>Quarterly visual inspection; and</li> <li>Annual independent auditing.</li> </ol>
Considerations in the event of a change in Scope	Impacts defined in <b>Table 53, Table 54, and Table 55.</b>	Should the scope change, the appointed EAP conducting the required EA amendment process in terms NEMA 2014 EIA Regulations, must develop a detailed monitoring programme and subsequently update this section.	Appointed EAP; and HoA.	To be determined.



## **HH) INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ENVIRONMENTAL AUDIT REPORT**

Section 34 of the NEMA 2014 EIA Regulations stipulates the requirements for auditing compliance with the Environmental Authorisation (EA), the EMPr, and the closure plan (in compliance with GN R. 1147).

It requires the holder of the authorisation, for the period during which the EA, EMPr, and closure plan are valid, to ensure compliance with all the conditions stipulated in these documents and that be audited. This audit report must then be submitted to the competent authority.

This audit report must adhere to the following conditions:

- Be prepared by an independent person with the relevant environmental auditing expertise;
- Provide verifiable findings, in a structured and systematic manner, on- (i) the level of performance against and compliance of an organization or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan; and (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity;
- Contain the information set out in Appendix 7 of GN R. 982; and
- Be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

The purpose of this audit report is also defined in the regulations and is as follows:

- Determine the ability of the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis and to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and
- To determine the level of compliance with the provisions of environmental authorisation, EMPr and where applicable the closure plan.

In the event that findings of the environmental audit report indicate insufficient mitigation of environmental impacts of the activity or insufficient levels of compliance with the requirements, the holder of the EA must submit recommendations to amend the EMPr or closure plan in order to rectify the shortcomings identified in the audit report.

The recommendations must be subjected to a public participation process which process has been agreed to by the competent authority and was appropriate to bring the proposed amendment of the EMPr and, where applicable the closure plan, to the attention of potential and registered interested and affected parties, including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the competent authority, for approval by the competent authority.



Within 7 days of the date of submission of an environmental audit report to the competent authority, the holder of an environmental authorisation must notify all potential and registered interested and affected parties of the submission of that report, and make such report immediately available:

- to anyone on request; and
- on a publicly accessible website, where the holder has such a website.

The environmental audit report must contain all information set out in Appendix 7 of the NEMA 2014 EIA Regulations.

It is recommended that this **independent audit** takes place on an **annual basis** or as specified by the competent authority in the EA.

In terms of the definition of the NEMA 2014 EIA Regulations, **independent** in relation to the person responsible for the preparation of an environmental audit report, means:

- That such person has no business, financial, personal, or other interest in the activity and is appointed in terms of the regulations; or
- That there are no circumstances that may compromise the objectivity of the person performing such work excluding fair remuneration for work performed in connection with the environmental audit report.

## II) ENVIRONMENTAL AWARENESS PLAN

General environmental awareness must be promoted amongst all Nomamix (Pty) Ltd employees.

Should the scope of the proposed non-invasive prospecting change (i.e. intrusive prospecting), a detailed Environmental Awareness Plan must be developed and implemented.

The purpose of an Environmental Awareness Plan is to outline the methodology that will be used to inform all employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid contamination or the degradation of the environment. The awareness plan is primarily a tool to introduce and describe the requirements of the range of environmental and social plans associated with the proposed prospecting activities. The environmental awareness plan ensures that training needs are identified, and appropriate training is provided.

The environmental awareness plan should at least communicate the following:

- Importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
- The significant environmental impacts and risks of an individual's work activities and the environmental benefits of improved performance;
- Individual's roles and responsibilities in achieving the aims and objectives of the environmental policy; and



- The potential consequences of not complying with environmental procedures.

**(2) MANNER IN WHICH THE APPLICANT INTENDS TO INFORM HIS OR HER EMPLOYEES OF ANY ENVIRONMENTAL RISK WHICH MAY RESULT FROM THEIR WORK**

In order for the environmental awareness policy to be effective, the issues raised through it need to be communicated through training sessions, meetings, consultations and progress reviews. The following are recommended minimum steps that can be taken to ensure communication is effective:

- The agendas of all company board meetings will have an item where issues environmental projects are discussed and feedback is given;
- Provide progress reports on the achievement of policy objectives and level of compliance with the approved EMPr and , if applicable, the closure plan complying with GN R. 1147, to the DMRE on request;
- Ensure environmental issues are realised at monthly mine management executive committee meetings and at all relevant, mine wide meetings, at all levels; and
- Ensure environmental issues are discussed at all general liaison meetings with local communities and other I&APs.

All employees are required to undergo environmental awareness induction training upon appointment and records of such training must be obtained and recorded. Refresher induction training must periodically take place.

Regular meetings (recommended to be done daily, at least once a week) communicating the following is recommended:

- Findings of environmental performance reports;
- Awareness raising campaigns discussing environmental topics; and
- Information of any environmental risk which may result from employee's work.

**(3) MANNER IN WHICH RISKS WILL BE DEALT WITH IN ORDER TO AVOID POLLUTION OR THE DEGRADATION OF THE ENVIRONMENT**

It is recommended that an awareness training schedule be developed. This schedule should at least indicate the following:

- Topic;
- Method of communicating i.e. through a workshop, training session, or meeting;
- Target group i.e. management, skilled or semi skilled labour, admin staff etc;
- Scheduled time; and
- Progress.

The following topics are recommended:

- Potential environmental risks;
- Legal requirements;
- Environmental Management System requirements;



- Environmental performance; and
- Environmental incidents addressing corrective and preventative measures to be implemented.

### **JJ) SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

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

See **Section v) of PART A – Scope of Basic Assessment Report.**

### **3. UNDERTAKING**

The EAP herewith confirms

- a. the correctness of the report accompanied by this declaration;
- b. the inclusion of comments and inputs from stakeholders and I&AP's;
- c. the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d. the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

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Signature of the Environmental Assessment Practitioner

Environmental Management Assistance (Pty) Ltd

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Name of Company:

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Date

**- END -**





## **APPENDIX A – EAP QUALIFICATIONS AND TEAM MEMBERS**



## APPENDIX B – LOCALITY MAP



## **APPENDIX C – SITE LAYOUT PLAN, SENSITIVITIES, AND LAND USE**



## APPENDIX D – SITE SENSITIVITY VERIFICATION



## APPENDIX E – PUBLIC PARTICIPATION



## APPENDIX F – SPECIALIST STUDIES



## **APPENDIX F.1 – AGRICULTURE AND SOIL ASSESSMENT**



## **APPENDIX F.2 – ARCHAEOLOGICAL, CULTURAL, AND PALAEOLOGY**





## APPENDIX F.3 - TERRESTRIAL ASSESSMENT



## **APPENDIX F.3.1 – VEGETATION AND PLANT SPECIE ASSESSMENT**



## **APPENDIX F.3.2 – ANIMAL SPECIE ASSESSMENT**



## **APPENDIX F.4 – AQUATIC BIODIVERSITY ASSESSMENT**



## **APPENDIX F.5 – HYDROLOGICAL FLOOD LINE DETERMINATION**



## APPENDIX F.6 – NOISE SCOPING ASSESSMENT



## APPENDIX G – EAP UNDERTAKING





