



**mineral resources**

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

**BASIC ASSESSMENT REPORT**  
**And**  
**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

**NAME OF APPLICANT:** Mwelase Group of Companies (Pty) Ltd

**TEL NO:** 011 802 0565

**FAX NO:** NA

**POSTAL ADDRESS:** Ground Floor, West Block; 28 Fricker Road; Illovo, Sandton

**PHYSICAL ADDRESS:** Ground Floor, West Block; 28 Fricker Road; Illovo, Sandton

**FILE REFERENCE NUMBER SAMRAD:** MP 30/5/1/1/2/16645PR



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

**PART A**  
**SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT**

**3. Contact Person and correspondence address**

**a) Details of**

**i) Details of the EAP**

Name of The Practitioner: Tim van Stormbroek

Tel No.: 082 483 6303

Fax No. : NA

e-mail address: tim@amberearth.co.za

**ii) Expertise of the EAP.**

**(1) The qualifications of the EAP**

Tim holds a Magister Technologiae (MTech) in Environmental Health (Ecotoxicology) and has studied various additional short courses. He started his professional career at the Impact Assessment cc assessing and writing reports on noise, chemical and thermal stresses and ventilation and illumination. At the same time and over a 5 year period he was also lecturing at the Cape Peninsula University of Technology (CPUT) and HACCP Academy on Occupation Health, Anatomy and Physiology, Management Practice and Food Hygiene. He was under full time employment at Ferret Mining and Environmental Service (Pty) Ltd for a 10 year period and was responsible for all aspects of environmental management with emphasis on EIA, BAR, WULA, monitoring and reporting in the mining industry. All related stakeholder engagement requirements on various projects was also undertaken. He is a qualified Radiation Protection Officer (RPO) registered with the National Nuclear Regulator and is also experienced in ISO 14001:2004 system development and implementation and is qualified as a lead auditor (TÜV SÜD). Tim has been leading Amber Earth consultancy since 2013. A copy of the applicable qualifications is available.

**(2) Summary of the EAP's past experience.**

(In carrying out the Environmental Impact Assessment Procedure)

The following Project examples are provided:

British American Tobacco

“ Waste License Application via NEMA Sec24G process

“ Environmental Authorisation for Solar PV Project

“ Water Use License

Masama Coal (Botswana)

“ EIA: Waste stream specialist study

Mzimkhulu Colliery

“ EMP Amendment

“ WULA

“ Monthly EMP and WUL compliance monitoring

#### Tasman RSA Mines

“ Public Consultation Process project management

“ Scoping, EIA/EMPr, Closure Plan Development

“ Departmental Liaison

#### Central Rand Gold Ltd

“ Monthly EMP Compliance Monitoring

“ Monthly Surface and Ground Water monitoring and reporting

“ Certificate of Registration application development and NNR approval

“ Public consultation

#### Wescoal Mining

“ Weekly waste management compliance inspection

“ Monthly EMP Compliance Monitoring

“ Monthly Surface and Ground Water monitoring and reporting

“ Monthly Change House Swab sampling

“ DMR/DWS Submission and liaison

“ Annual Water Use License External Audits

“ EMPr Amendment and Consolidation

“ Closure Plan Development

#### Bokoni Platinum Mine

“ Bi-annual Sewage Plant Audits (5 x sewage treatment plants)

“ Annual Waste Management Audits

“ Soil contamination assessment

“ EMPr Consolidation

“ Closure Plan Revision

#### Eskom Generation - Coal

“ ISO14001 Certification audits under TÜV SÜD for 13 Eskom Power Stations

#### Eskom Generation . Nuclear

“ ISO14001 Certification audits under TÜV SÜD for Koeberg Power Stations

#### Kendal Siding

“ WUL application

“ Dust fall out monitoring (monthly)

“ Surface and ground water monitoring (monthly)

#### Transalloys

“ Alien Vegetation Assessment and control programme

“ Ground Water Impact Assessment

#### Anglo Coal: Kleinkopje Colliery

“ Section 102 EMPr amendment

“ EMPr amendment public consultation process

“ Independent Power Producer (Khanyisa Power Station) EIA: Waste Stream Specialist Study

#### Keldoron

“ Mining Right EIA/EMP Development

#### Council for Scientific and Industrial Research (CSIR)

“ Alien vegetation eradication plan implementation . 15ha

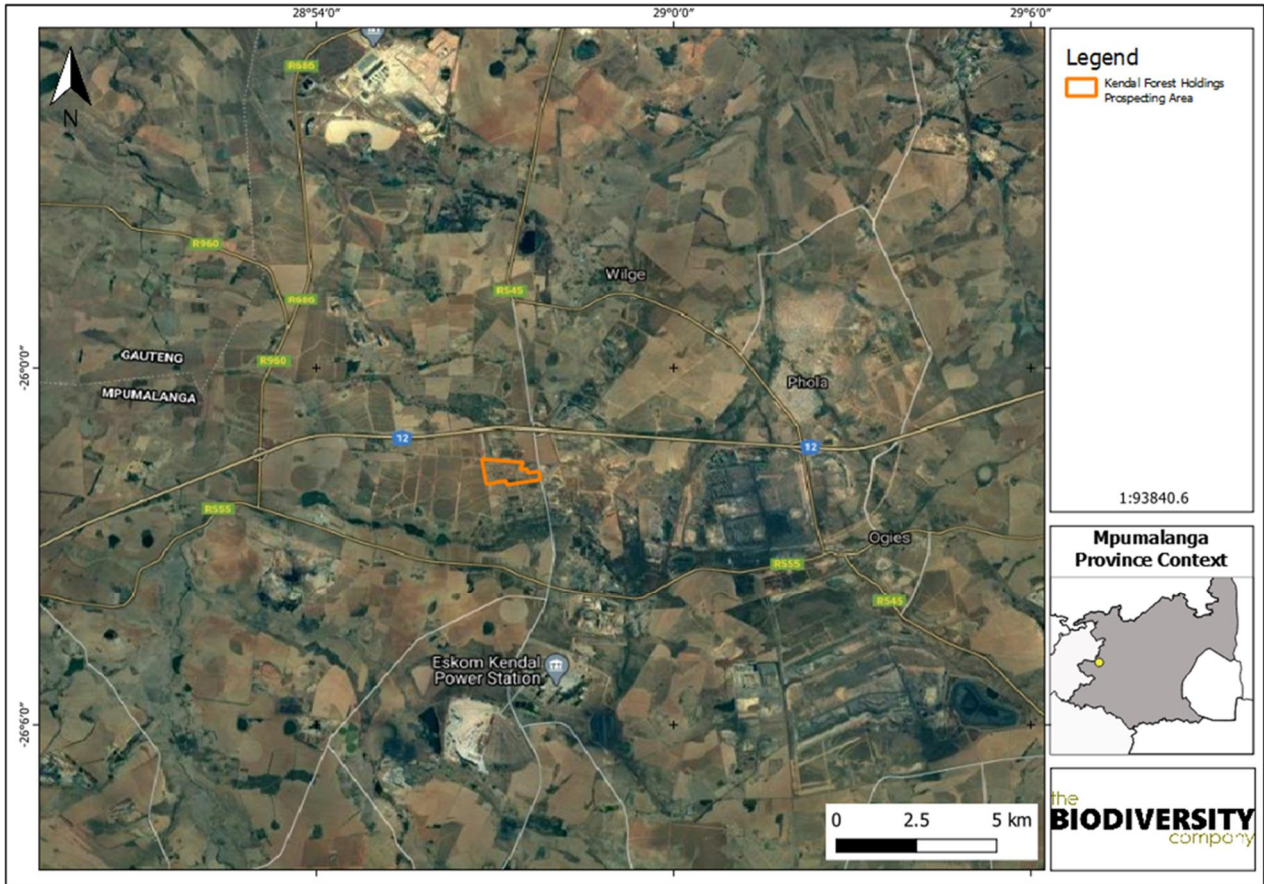
#### Mashala Resources

“ Section 102 EMPr amendment for inclusion of additional surface area

**b) Location of the overall Activity.**

<b>Farm Name:</b>	COMPRISING OF A PORTION OF PORTION 26 OF THE FARM HEUVELFONTEIN 215 I.R. (ALSO KNOWN AS KENDAL FOREST HOLDINGS . HOLDINGS NUMBERS 3, 4, 19, 21, 22, 23, 38, 39, 40, 41, 42, 57, 58, 59, 60, 61, 77, 78, 79, 80 HELLER AVE AND PORTIONS OF FIRST AVE, SECOND AVE, THIRD STREET AND KENDAL ROAD.
<b>Application area (Ha)</b>	Extent of application area = 88,1011 hectares
<b>Magisterial district:</b>	Emalahleni Magisterial District
<b>Distance and direction from nearest town</b>	9km West of the town of Ogies in the Magisterial District of Delmas (26_1q23+S 28_57q52+E)
<b>21 digit Surveyor General Code for each farm portion</b>	Plot 3: T0IR0355000000300000 Plot 4: T0IR0355000000400000 Plot 19: T0IR03550000001900000 Plot 21: T0IR03550000002100000 Plot 22: T0IR03550000002200000 Plot 23: T0IR03550000002300000 Plot 38: T0IR03550000003800000 Plot 39: T0IR03550000003900000 Plot 40: T0IR03550000004000000 Plot 41: T0IR03550000004100000 Plot 42: T0IR03550000004200000 Plot 57: T0IR03550000005700000 Plot 58: T0IR03550000005800000 Plot 59: T0IR03550000005900000 Plot 60: T0IR03550000006000000 Plot 61: T0IR03550000006100000 Plot 77: T0IR03550000007700000 Plot 78: T0IR03550000007800000 Plot 79: T0IR03550000007900000 Plot 80: T0IR03550000008000000

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



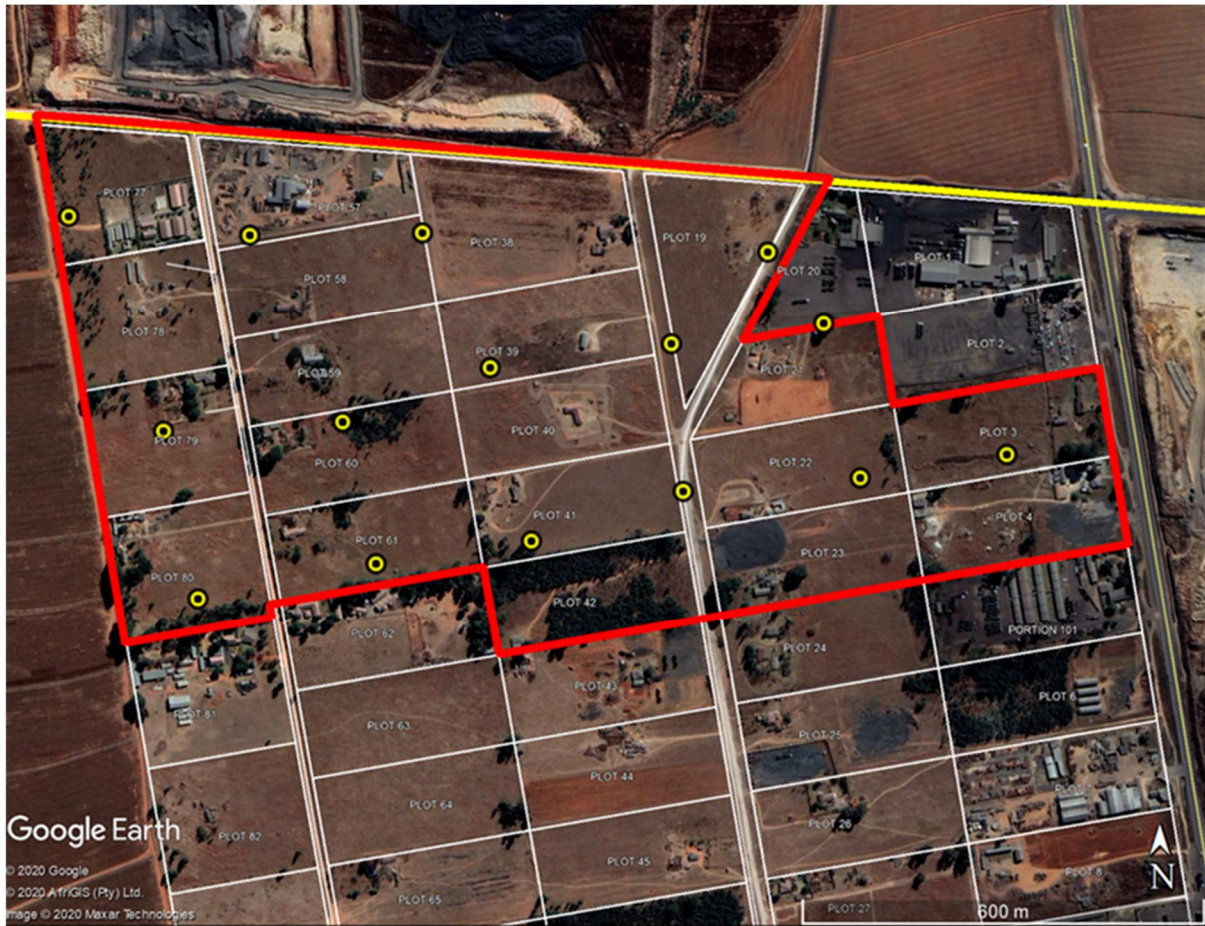
**Figure 1: Locality Plan**





**d) Description of the scope of the proposed overall activity.**

The applicant, Mwelase Group of Companies Pty Ltd, are applying for a prospecting Right over the above-mentioned properties for coal. Figure 3 below illustrates the application area relative to the individual plots as well as the initial 15 bore hole positions. Later infill bore holes will be sited in accordance with resource results.



**Figure 3. Positions of initial bore hole locations.**

**(i) Listed and specified activities**

<b>NAME OF ACTIVITY (All activities including activities not listed) (E.g. For Prospecting: drill sites, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route, etc...etc...etc.)</b>	<b>Aerial extent of the Activity Ha or m<sup>2</sup></b>	<b>LISTED ACTIVITY Mark with an X where applicable or affected.</b>	<b>APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED</b>
<u>Prospecting:</u> An initial 15 diamond core drill holes (64mm diameter) are planned within the prospecting application area. These will be drilled to an approximate depth of 40mbs. A diamond drill rig and its associated infrastructure (i.e. sump) require approximately 115m <sup>2</sup> at each drill site. In-fill drilling will be conducted based on the PWP and results of initial drilling.	88,1011 hectares	X Activity 20	GN R327
<u>Ancillary Activities:</u> Site office: this will be off-site Sample/core storage: this will be off-site Equipment Storage: this will be off-site.	Off-site	NA	NA
<u>Ablution Facilities:</u> A single chemical toilet will be made available for the drilling team at the drill rig.	Within the 115m <sup>2</sup> drill pad area.	NA	NA
<u>Site Access:</u> No road access development is planned. The best practical route from the plot entrance to the bore hole site will be discussed with each land owner/occupier. Due to the short duration of drilling no road development/clearing will be required.	This will be agreed with the land owner/legal occupier within the total 88,1011 hectares	NA	NA
<u>Clearance of Vegetation:</u> Clearance of vegetation will be limited to the drill pad area and will be done in consultation with the land owner/occupier.	Within the 115m <sup>2</sup> drill pad area.	NA	NA

**(ii) Description of the activities to be undertaken**

- Non-Invasive Prospecting: digital desktop map work
- Invasive Prospecting: Diamond core drilling and core logging and evaluation
- Bore Hole rehabilitation: Capping of bore hole with a suitable stone/slab/cover which will not allow the topsoil cover to subside.  
Scarification of final drill footprint topsoil.

**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>	<b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</b>  (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
National Environmental Management Act (Act 107 of 1998)	Chapter 6 of GNR 982 promulgated under NEMA	Environmental Authorisation has been applied for prospecting. No prospecting will take place without an approved prospecting right.

**f) Need and desirability of the proposed activities.**

When assessing the need and desirability of this prospecting right application, the following needs to be considered:

- The intended purpose of a prospecting right application for coal is to pursue a mining right application should the resource justify this and all the legislated requirements be met.
- The Kusile Power Station site/position was historically selected based primarily on the local coal resources to supply the power station for its lifetime.
- The Kendal Power Station is also in close proximity to this prospecting application area.
- Its location and relative proximity between the Kendal and now operational Kusile Power Stations makes this potential resource important for the Eskom fleet.

**g) Motivation for the overall preferred site, activities and technology alternative.**

The availability and geographic location of the mineral resource that the applicant wishes to prospect dictates the preferred location to a large degree. The location of the bore holes are determined by the anticipated location of the mineral resource. Although the location of the minerals cannot be altered, the impact of the prospecting footprint associated with drilling has been assessed in this BAR.

Key criteria for consideration when identifying need, alternatives and preferred location include practicability, feasibility, relevance, reasonability and viability. Mwelase Group of Companies propose to follow the most pragmatic prospecting method to determine and evaluate the mineral resource while minimizing surface disturbance.

**h) Full description of the process followed to reach the proposed preferred alternatives within the site.**

Since no site infrastructure is planned for this prospecting right application, no site alternatives have been considered. The positions of the initial bore holes (which constitutes site activities) as indicated in Figure 3 above were sited by the project Geologist based on the Prospecting Work Programme and the initial resource determination drilling. The final actual location of each bore hole will be finalised through liaison with the landowner and/or occupier where applicable. Wherever possible existing infrastructure must be avoided.

**i) Details of the development footprint alternatives considered.**

The only alternative/s that can be considered for this prospecting application are the locations of bore hole positions. This is because no other infrastructure is planned on site. All other infrastructure such as offices/core storage/equipment storage/vehicle over-night parking will be off-site.

The final location/siting of bore holes will be done in consultation with the landowners and/or land occupier to ensure that impact/s on existing plot infrastructure is minimized.

## ii) Details of the Public Participation Process Followed

### Site Notices:

Site notices will be placed on the boundary of the application area on 15 January 2021. A copy of these site notices and evidence of their erection with coordinates will be provided in Appendix 3.

### News Paper Advert:

A newspaper advert will be placed in the Witbank News and published on 15 January 2021. A copy of the advert proof as well as the news paper tear page will be provided in Appendix 3.

### Background Information Document:

The Background Information Document (BID) included the following information:

- Proposed Activities
- Location Map
- Initial bore hole location map
- NEMA Listed Activity
- DMRE Reference number
- Size of the application area
- Contact details of the EAP
- Invitation to comment on the Draft BAR
- A description of the anticipated scale of the impact of prospecting drilling
- Notification of the 30 day comment period (a total time of 32 days has been provided)
- A IAP Registration and Comment sheet
- Mechanism for providing comment either in hard copy (i.e. handed back to the EAP during one-on-one consultation or scanned and emailed or photographed and sent via WhatsApp).

A Background Information Document was prepared and distributed by hand to all land owners/occupiers where such persons were available on their properties. Each person who received the BID were requested to sign for receipt. Where no person was available the BID was emailed to those where email addresses were available. Where only postal addresses were available the BID was set via registered mail.

### Public Meeting:

A public meeting opportunity is normally available to all IAPs on request however the COVID-19 Level 3 lockdown at the time of consultation meant that socially distanced one-on-one consultation and remote consultation were favoured. It should however be stated that no requests for consultation were denied. A 1 hour MS Teams meeting was arranged and held with the legal representatives of Plot 1 on 10 February 2021.

### Door to door Consultation:

On Friday 15 January 2021 the Amber Earth team will conduct door-to-door consultation of the affected plots as well as the neighbouring plots. A record of this consultation and physical distribution of the BID will be included in Appendix 3.



iii) **Summary of issues raised by I&Aps**  
 (Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an <b>X</b> where those who must be consulted were in fact consulted.		Comments Received			
<b><u>AFFECTED PARTIES</u></b>					
Landowner/s	<b>X</b>		Please see the Issues and Response Report included in Appendix 3 where all comments and responses have been captured.		
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	<b>X</b>				
Municipal councillor	<b>X</b>				
Municipality	<b>X</b>				
Organs of state (Responsible for infrastructure that may be					

<b>affected Roads Department, Eskom, Telkom, DWA e</b>					
<b>Communities</b>					
<b>Dept. Land Affairs</b>					
<b>Traditional Leaders</b>					
<b>Dept. Environmental Affairs</b>					
<b>Other Competent Authorities affected</b>					
<b><u>OTHER AFFECTED PARTIES</u></b>					
<b><u>INTERESTED PARTIES</u></b>					



#### iv) The Environmental attributes associated with the alternatives.

##### (1) Baseline Environment

##### (a) Type of environment affected by the proposed activity.

Note: References to section numbers, table and figure numbers are directly referenced from the specialist study for ease of cross-reference.

#### Terrestrial Ecology

##### Desktop Spatial Assessment

The following features describes the general area and habitat, this assessment is based on spatial data that are provided by various sources such as the provincial environmental authority and SANBI. The desktop analysis and their relevance to this project are listed in Table Error! **No text of specified style in document.**-1 of the specialist report in Appendix 4.

Table Error! **No text of specified style in document.**-1 Desktop spatial features examined.

Desktop Information Considered	Relevant/Not relevant	Section
Conservation Plan	The various drill sites fall in areas classified as Heavily modified, Moderately modified -old lands; and Other Natural areas.	7.1.2
Rocky Ridges	Irrelevant: Mpumalanga does not have regulations for ridges	-
Ecosystem Threat Status	The ecosystem associated with the project area is classified as VU	7.1.3.1
Ecosystem Protection Level	The protection level of the ecosystem is rated as "poorly protected"	7.1.3.2
Protected Areas	Irrelevant: 23 km from John Cairns Private Nature Reserve	-
SAIIAE	No wetlands can be found in the with 500m of the project area	7.1.3.3
Mpumalanga Highveld wetlands	No wetlands can be found in the with 500m of the project area	7.1.4
Nation Protected Areas Expansion Priority Areas (NPAES)	Irrelevant: 22 km to the closest NPAES NW/ Gauteng Bushveld NPAES	-
Mpumalanga Protected Areas Expansion Priority Areas	Irrelevant: 11.7 km to a provincially protected area expansion priority area	-
Important Bird and Biodiversity Areas	Irrelevant: The project area is 39 km from the Devon Grassland IBA	-

##### Project Area in Relation to the Mpumalanga Biodiversity Sector Plan

The key output of this systematic biodiversity plan is a map of biodiversity priority areas (MTPA, 2014). The MBSP CBA map delineates Critical Biodiversity Areas, Ecological Support Areas, Other Natural Areas, Protected Areas, and areas that have been irreversibly modified from their natural state (MTPA, 2014).

**CBAs** are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species (MTPA, 2014). Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

The Mpumalanga Biodiversity Sector Plan (MBSP) specifies two different CBA areas, **Irreplaceable CBA's and Optimal CBA's**. Irreplaceable CBA's include: (1) areas required to meet targets and with irreplaceability biodiversity values of more than 80%; (2) critical linkages or pinch-points in the landscape that must remain natural; or (3) critically Endangered ecosystems (MTPA, 2014).

**ESAs** are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services. Critical Biodiversity Areas and Ecological Support Areas may be terrestrial or aquatic (SANBI-BGIS, 2017).

**ONAs** consist of all those areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESAs. A biodiversity sector plan or bioregional plan must not specify the desired state/management objectives for ONAs or provide land-use guidelines for ONAs (SANBI-BGIS, 2017).

**Moderately or Heavily Modified Areas** (sometimes called ~~transformed~~ areas) are areas that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets (MTPA, 2014). Some of these areas may still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significantly, and in many cases irreversibly, compromised.

**Error! Reference source not found.** shows the project area overlaps with the terrestrial features classified as

- Heavily modified;
- Moderately modified -old lands; and
- Other Natural areas.



**Figure 7-1** The project area superimposed on the Mpumalanga Biodiversity Sector Plan, Terrestrial CBA (MTPA, 2014).

**Project Area in Relation to the NBA**

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period (Skowno *et al.*, 2019).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors (Skowno *et al.*, 2019).

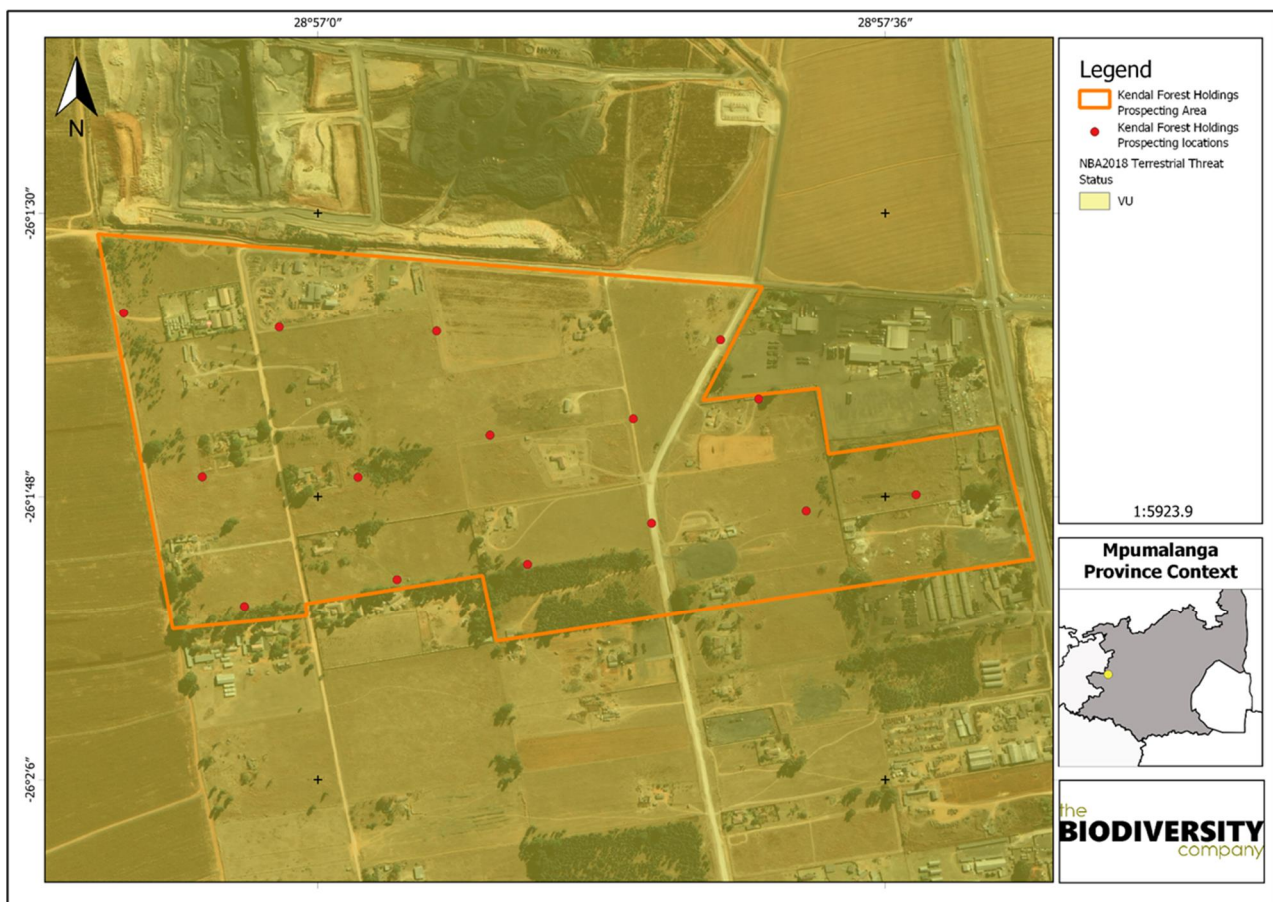
The two headline indicators assessed in the NBA are *ecosystem threat status* and *ecosystem protection level* (Skowno *et al.*, 2019).

### (a) Ecosystem Threat Status

Ecosystem threat status outlines 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 (Skowno *et al.*, 2019).

Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno *et al.*, 2019).

The project area was superimposed on the terrestrial ecosystem threat status (Figure Error! No text of specified style in document.-1). The whole project area is situated in a VU ecosystem (Figure Error! No text of specified style in document.-1).



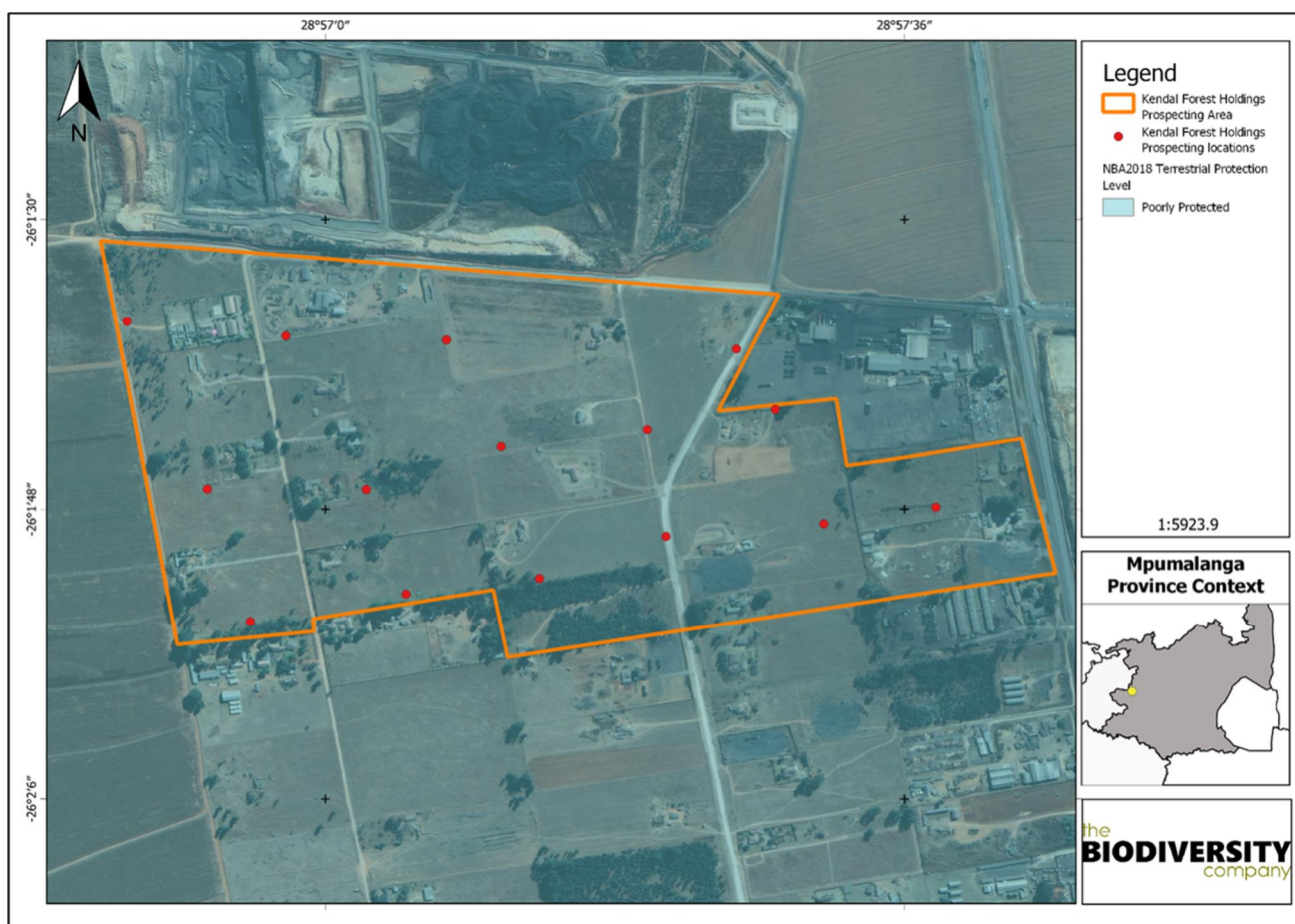
**Figure Error! No text of specified style in document.-1. The project area showing the regional ecosystem threat status of the associated terrestrial ecosystems (NBA, 2018).**

### Ecosystem Protection Level

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 Protected Areas Act (Skowno *et al.*, 2019).

The project area was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystems associated with the prospecting (Figure Error! No text of specified style in document.-2). Based on Figure Error! No text of specified style in document.-2 the terrestrial ecosystems associated the project

area is classified as *poorly protected*. This means that these ecosystems are considered not to be adequately protected in areas such as national parks or other formally protected areas.



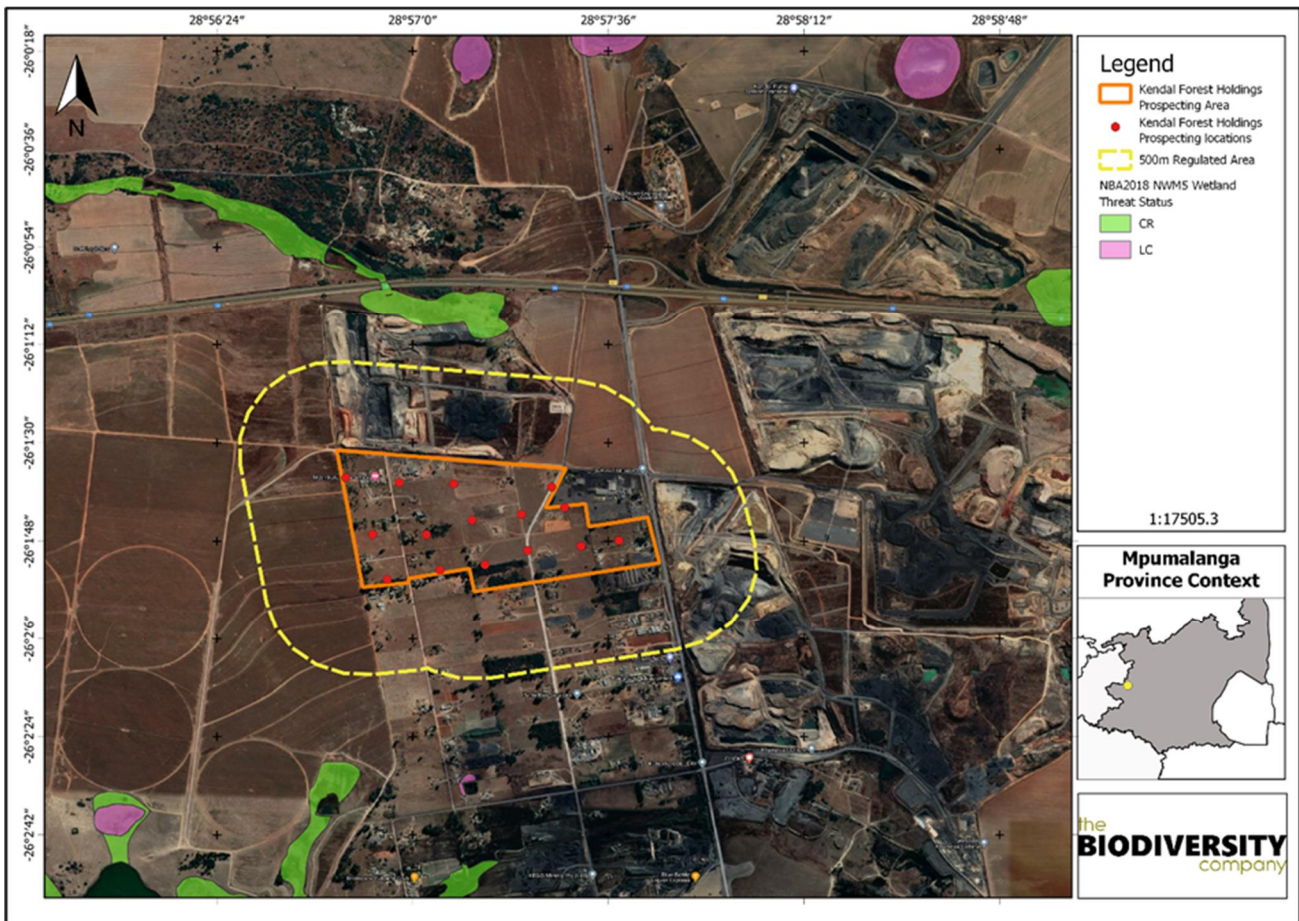
**Figure Error! No text of specified style in document.-2. The project area showing the regional level of protection of terrestrial ecosystems (NBA, 2018).**

### Wetland National Biodiversity Assessment

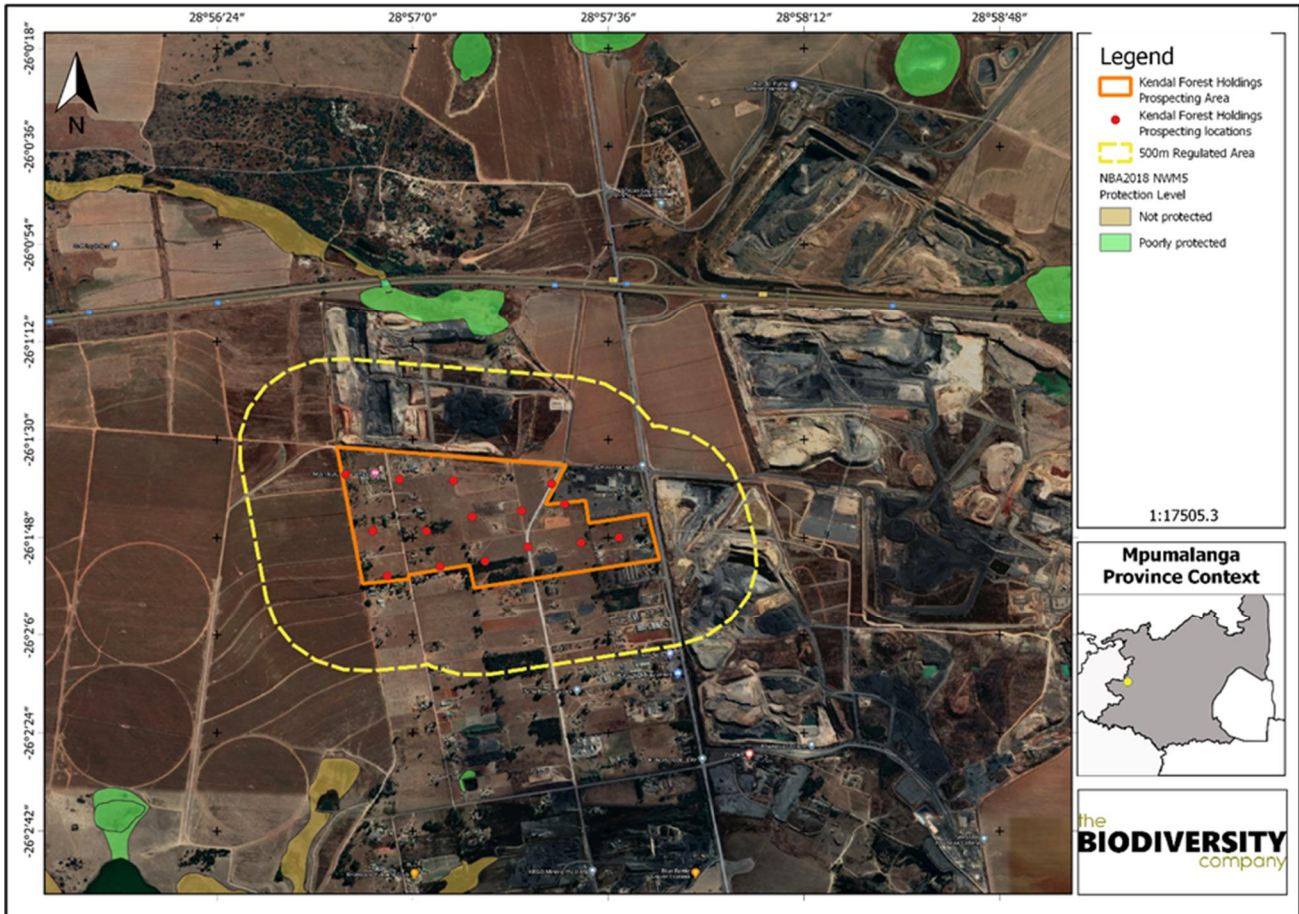
This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA) 2018. National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) 2018.

Ecosystem threat status (ETS) of river ecosystem types is based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LC, with CR, EN and VU ecosystem types collectively referred to as *threatened* (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019).

Figure Error! No text of specified style in document.-3 shows that no wetlands can be found in or within the 500m regulated area based on the NBA (2018) data (Figure Error! No text of specified style in document.-4).



**Figure Error! No text of specified style in document.-3. The project area in relation to the NBA threat status of the wetlands (NBA, 2018)**



**Figure Error! No text of specified style in document.-4. The project area in relation to the NBA Protection level of the wetlands (NBA, 2018).**

### Mpumalanga Highveld Wetlands

The purpose of the Mpumalanga Highveld Grasslands Wetland project was to:

- Ground-truth and refine the current data layers of the extent, distribution, condition and type of freshwater ecosystems in the Mpumalanga Highveld coal belt, to support informed and consistent decision-making by regulators in relation to the water-biodiversity-energy nexus;
- To incorporate these revised data layers into the atlas of high-risk freshwater ecosystems and guidelines for wetland offsets, currently being developed by SANBI, to improve the scientific robustness of these tools; and
- To support the uptake, and development of the necessary capacity to apply the data, atlas and guidelines by regulators and the coal mining industry in their planning and decision-making processes (SANBI, 2012).

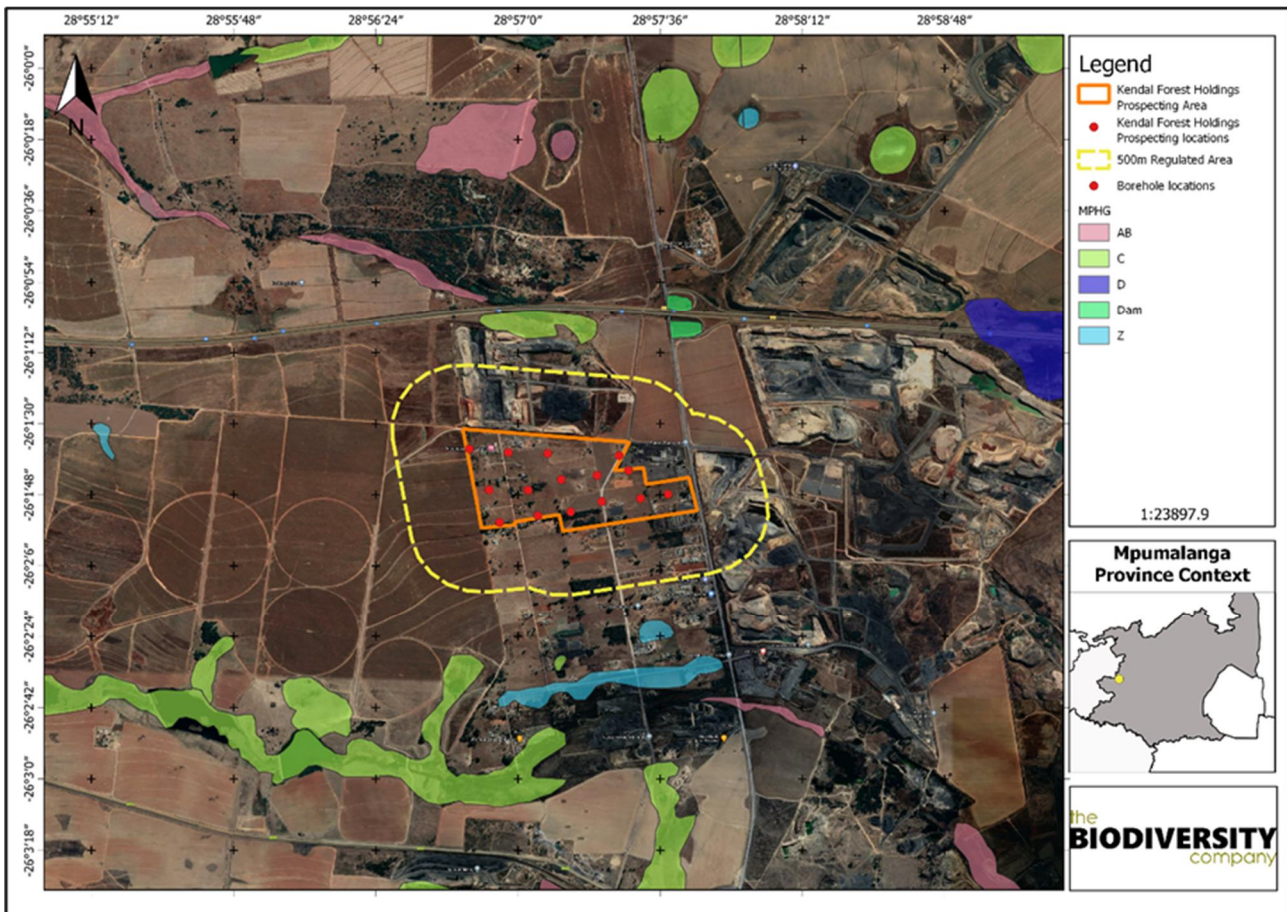
The Mpumalanga Highveld Grasslands Wetland data also classifies NFEPA land cover based on the defined condition of each area. These are known as the NFEPA wetland conditions categories. The categories are listed in Table Error! No text of specified style in document.-2 and are represented in relation to the project area in Figure Error! No text of specified style in document.-5.

**Table Error! No text of specified style in document.-2. A breakdown of the NFEPA wetland condition categories as defined by the MH dataset**

Description of NFEPA wetland conditions categories. PES equivalent provides a description of the condition category that is broadly equivalent to that used by the Department of Water Affairs to describe Present Ecological State. Percentage of total area in each condition category is also provided.			
PES equivalent	NFEPA condition	Description	% of total wetland area*
Natural or Good	AB	Percentage natural land cover $\geq$ 75%	47
Moderately modified	C	Percentage natural land cover 25-75%	18
Heavily to critically modified	DEF	Riverine wetland associated with a D, E, F or Z ecological category river	2
	Z1	Wetland overlaps with a 1:50,000 "artificial" inland water body from the Department of Land Affairs: Chief Directorate of Surveys and Mapping (2005-2007)	7
	Z2	Majority of the wetland unit is classified as "artificial" in the wetland delineation GIS layer	4
	Z3	Percentage natural land cover < 25%	20

*\* This percentage excludes the unmapped wetlands that have been irreversibly lost due to draining, ploughing and concreting*

Figure Error! No text of specified style in document.-5 below shows the project area in relation to the Mpumalanga Highveld Grasslands Wetland data as provided by SANBI. The project area does not intersect with FEPA wetlands.



**Figure Error! No text of specified style in document.-5. Shows the overall project area in relation to the Mpumalanga Highveld Grasslands Wetlands (SANBI, 2012).**

## Vegetation Assessment

The project area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

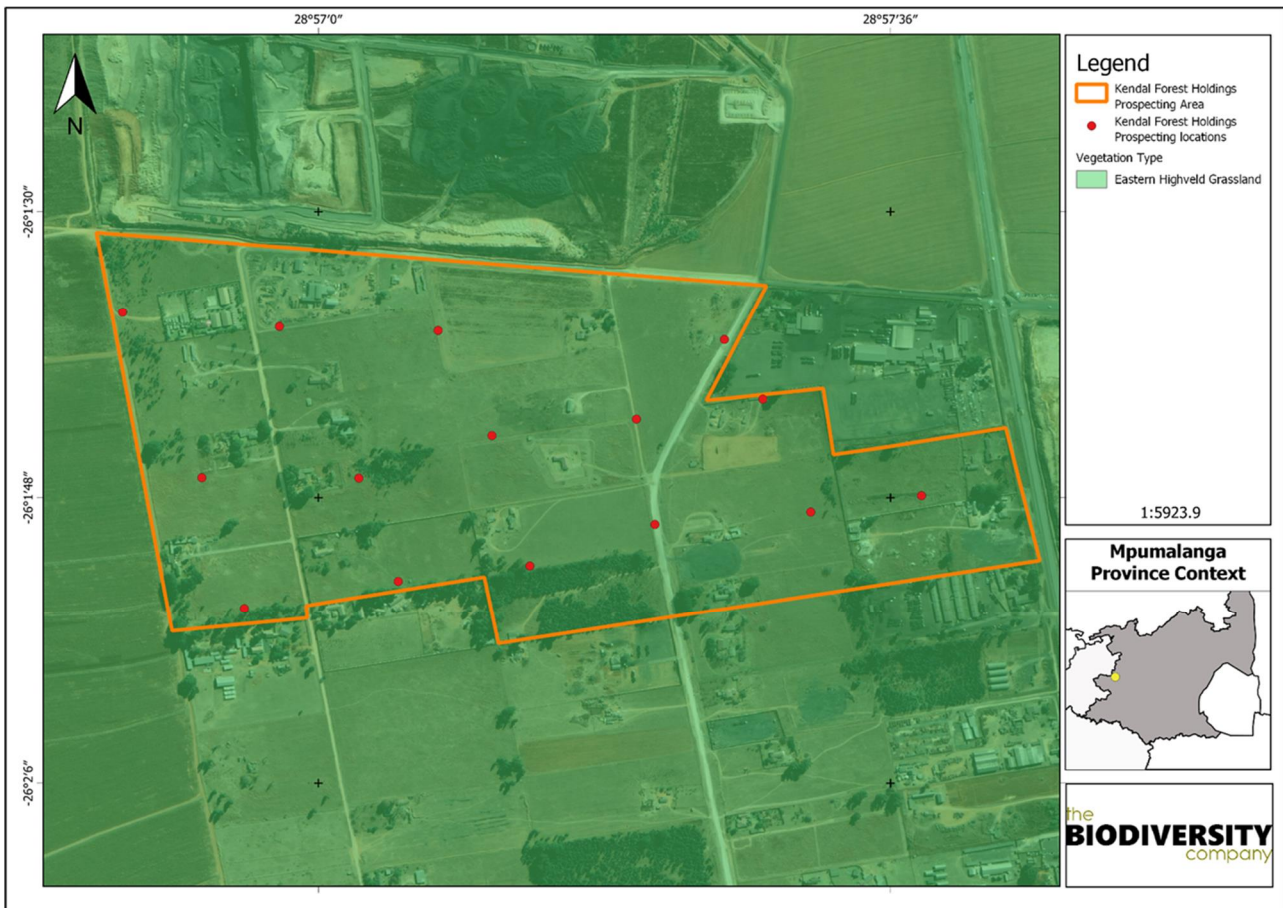
- Seasonal precipitation; and
- The minimum temperatures in winter (Mucina & Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

## Vegetation Types

The grassland biome comprises many different vegetation types. The whole project area is found within the Eastern Highveld Grassland according to Mucina & Rutherford (2006) (Figure Error! No text of specified style in document.-6).



**Figure Error! No text of specified style in document.-6. The project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2018).**

### Eastern Highveld Grassland

This vegetation type occurs on slightly to moderately undulating planes, including some low hills and pan depressions. The vegetation is a short dense grass land dominated by the usual highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small scattered rocky outcrops with, wiry sour grasses and some woody species. Some 44% transformed primarily by cultivation, plantations, mines, urbanisation and by building of dams. No serious alien invasions are reported (Mucina & Rutherford, 2006).

### Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

The following species are important in the **Eastern Highveld Grassland** vegetation type:

**Graminoids:** *Aristida aequiglumis*, *A. congesta*, *A. junciformis* subsp. *Galpinii*, *Brachiaria serrata*, *Cynodon dactylon*, *Digitaria monodactyla*, *D. tricholaenoides*, *Elionurus muticus*, *Eragrostis chloromelas*, *E. curvula*, *E. plana*, *E. racemosa*, *E. sclerantha*, *Heteropogon contortus*, *Loudetia simplex*, *Microchloa caffra*, *Monocymbium cerasiiforme*, *Setaria sphacelata*, *Sporobolus africanus*, *S. pectinatus*, *Themeda triandra*, *Trachypogon spicatus*, *Tristachya leucothrix*, *T. rehmanni*, *Alloteropsis semialata* subsp. *eckloniana*, *Andropogon appendiculatus*, *A. schirensis*, *Bewisia biflora*, *Ctenium concinnum*, *Diheteropogon amplectens*, *Eragrostis capensis*, *E. gummiflua*, *E. patentissima*, *Harpochloa falx*, *Panicum natalense*, *Rendlia altera*, *Schizachyrium sanguineum*, *Setaria nigrirostris*, *Urelytrum agropyroides*;

**Herbs:** *Berkheya setifera*, *Haplocarpha scaposa*, *Justicia anagalloides*, *Acalypha angusta*, *Chamaecrista mimosoides*, *Dicoma anomala*, *Euryops gilfillanii*, *E. transvalensis* subsp. *setilobus*, *Helichrysum aureonitens*, *H. caespitium*, *H. callicomum*, *H. oreophilum*, *H. caespitium*, *H. oreophilum*, *H. rugulosum*, *Ipomoea crassipes*,



*Pentanisia prunelloides* subsp. *latifolia*, *Selago densiflora*, *Senecio coronatus*, *Vernonia oligocephala*, *Wahlenbergia undulata*;

**Geophytic herbs:** *Gladiolus crassifolius*, *Haemanthus humilis* subsp. *hirsutus*, *Hypoxis rigidula* var. *pilosissima*, *Ledebouria ovatifolia*;

**Succulent herb:** *Aloe ecklonis*; and

**Low shrubs:** *Anthospermum rigidum* subsp. *pumilum*, *Stoebe plumosa*.

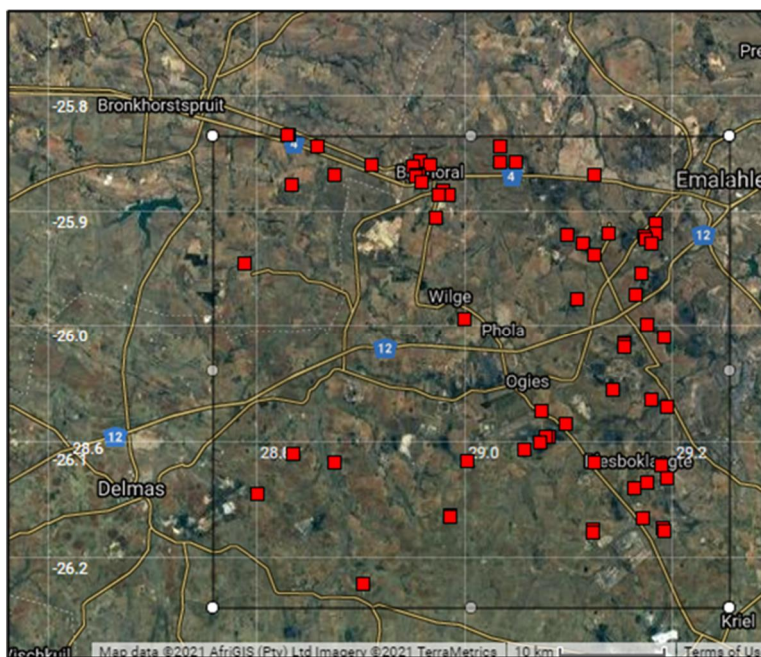
### Conservation Status

According to Mucina and Rutherford (2006), this vegetation type is classified as Endangered. The national target for conservation protection for both these vegetation types is 24%, but only a few patches are statutorily conserved in Nooitgedacht Dam and Jericho Dam Nature Reserves and in private reserves (Holkranse, Kransbank, Morgenstond).

Some 44% of this vegetation type has already been transformed primarily by cultivation, plantations, mines, urbanisation and by building of dams. Cultivation may have had a more extensive impact, indicated by land-cover data. No serious alien invasions are reported, but *Acacia mearnsii* can become dominant in disturbed sites.

### Plant Species of Conservation Concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, 485 plant species have the potential to occur in the project area and its surroundings (Figure Error! No text of specified style in document.-7). Of these 485 plant species, four are classified as Species of Conservation Concern (SCC) (Table Error! No text of specified style in document.-3).



**Figure Error! No text of specified style in document.-7. Map showing the grid drawn in order to compile an expected plant species list (BODATSA-POSA, 2019)**

**Table Error! No text of specified style in document.-3. Plant species of conservation concern**

Family	Taxon	Author	IUCN	Ecology
Hyacinthaceae	<i>Merwillia plumbea</i>	(Lindl.) Speta	NT	Indigenous
Amaryllidaceae	<i>Nerine gracilis</i>	R.A.Dyer	VU	Indigenous; Endemic
Fabaceae	<i>Argyrolobium longifolium</i>	(Meisn.) Walp.	VU	Indigenous; Endemic
Iridaceae	<i>Gladiolus paludosus</i>	Baker	VU	Indigenous

## Faunal Assessment

### Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 236 bird species have the potential to occur in the vicinity of the project area. The full list of potential bird species is provided in Appendix B of the specialist report.

Of the potential bird species, twelve (12) species are listed as SCC either on a regional or global scale (Table Error! No text of specified style in document.-4).

The SCC include the following:

- Two (2) species that are listed as EN on a regional basis;
- Four (4) species that are listed as VU on a regional basis; and
- Six (6) species that are listed as NT on a regional basis.

On a global scale, three (3) species are listed as VU and three (3) species as NT (Table Error! No text of specified style in document.-4).

**Table Error! No text of specified style in document.-4. List of bird species of regional or global conservation importance that are expected to occur in close vicinity to the project area.**

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Low
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU	Low
<i>Circus ranivorus</i>	Marsh-harrier, African	EN	LC	Low
<i>Geronticus calvus</i>	Ibis, Southern Bald	VU	VU	Moderate
<i>Glareola nordmanni</i>	Pratincole, Black-winged	NT	NT	Low
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Low
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT	Low
<i>Phoenicopterus minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Phoenicopterus ruber</i>	Flamingo, Greater	NT	LC	Low
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU	Moderate
<i>Sterna caspia</i>	Tern, Caspian	VU	LC	Low
<i>Tyto capensis</i>	Grass-owl, African	VU	LC	Low

*Geronticus calvus* (Southern Bald Ibis) is listed as VU on a regional basis and prefers high rainfall (>700 mm p.a.), sour and alpine grasslands, with an absence of trees and a short, dense grass sward and also occurs in lightly wooded and relatively arid country. It forages on recently burned ground, also using unburnt natural grassland, cultivated pastures, reaped maize fields and ploughed areas. It has a varied diet, mainly consisting of insects and other terrestrial invertebrates (IUCN, 2017). The likelihood of occurrence is rated as moderate as suitable foraging habitat can be found in the project area.

*Sagittarius serpentarius* (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The likelihood of occurrence is rated as moderate as suitable grasslands can be found in the project area, the level of disturbance nearby does decrease the likelihood of occurrence of this species.

## Mammals

The IUCN Red List Spatial Data (IUCN, 2017) lists 74 mammal species that could be expected to occur within the project area. Species that are generally restricted to protected areas such as game reserves, are not expected to occur in the project area and were removed from the expected species list.

Of the 74 mammal species, sixteen (16) are listed as being of conservation concern on a regional or global basis (Table Error! No text of specified style in document.-5).

The list of potential species includes:

- Three (3) that are listed as EN on a regional basis;
- Five (5) that are listed as VU on a regional basis;
- Seven (7) that are listed as NT on a regional scale.

On a global scale, 1 is listed as EN, 2 are listed as VU and 5 as NT (Table Error! No text of specified style in document.-5).

**Table Error! No text of specified style in document.-5. List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses.**

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Low
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC	Moderate
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC	Low
<i>Crocidura maquassiensis</i>	Makwassie musk shrew	VU	LC	Low
<i>Dasymys incomtus</i>	African Marsh rat	NT	LC	Low
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT	Low
<i>Leptailurus serval</i>	Serval	NT	LC	Moderate
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Ourebia ourebi</i>	Oribi	EN	LC	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low
<i>Pelea capreolus</i>	Grey Rhebok	NT	NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Moderate
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	LC	Low

*Atelerix frontalis* (South African Hedgehog) has a tolerance of a degree of habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), *A. frontalis* populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Based on the grassland habitat that can be found in the project area there is a moderate likelihood of this species occurring.

*Leptailurus serval* (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types.

Grasslands can be found in the project area and wetlands can be found nearby, therefore the species has a moderate likelihood of occurrence.

*Poecilogale albinucha* (African Striped Weasel) is usually associated with savanna habitats, although it probably has a wider habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is sufficient habitat although somewhat disturbed for this species in the project area and the likelihood of occurrence of this species is therefore considered to be moderate.

### Herpetofauna (Reptiles & Amphibians)

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2019) 58 reptile species have the potential to occur in the project area. Three of the expected species are SCCs (IUCN, 2017) (Table Error! No text of specified style in document.-6).

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2019) 20 amphibian species have the potential to occur in the project area. No amphibian SCCs is expected to be present in the project area.

**Table Error! No text of specified style in document.-6. Reptile specie of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2016).**

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	NT	NT	Low
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	LC	Low
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC	Moderate

*Homoroselaps dorsalis* (Striped Harlequin Snake) is partially fossorial and known to inhabit old termitaria in grassland habitat (IUCN, 2017). Most of its range is at moderately high altitudes, reaching 1,800 m in Mpumalanga and Swaziland, but it is also found at elevations as low as about 100 m in KwaZulu-Natal. The likelihood of occurrence was rated as moderate as suitable grassland habitat can be found in the project area.

### Pedology

#### Soils and Geology

According to the land type database (Land Type Survey Staff, 1972 - 2006), the project area is characterised by the Ba4 land type, with Ba5 nearby (Figure Error! No text of specified style in document.-8). Figure Error! No text of specified style in document.-9 illustrates the terrain units relevant to the Ba4 land type with the expected soils illustrated in Error! Reference source not found..



Figure Error! No text of specified style in document.-8. The project in relation to the land type.

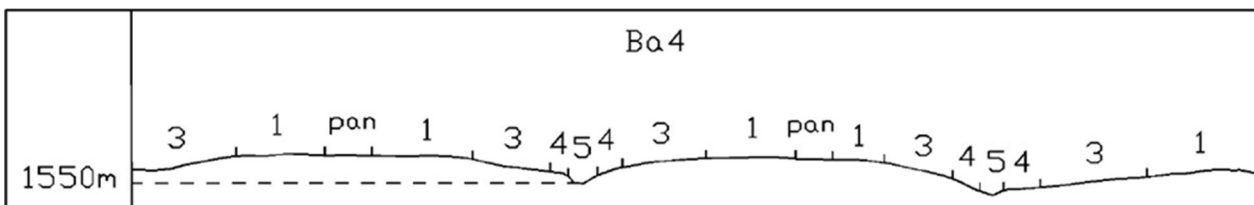


Figure Error! No text of specified style in document.-9. Illustration of land type Ba4 terrain units (Land Type Survey Staff, 1972 – 2006).

Table 7- 7. Soils expected at the respective terrain units within the Ba4 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units							
1 (45%)		3 (40%)		4 (10%)		5 (5%)	
Hutton	35	Hutton	50	Avalon	30	Katspruit	40
Pans	20	Avalon	15	Longlands	40	Longlands	30
Avalon	10	Longlands	10	Clovelly	20	Willowbrook	20
Wasbank	10	Wasbank	5	Cartref	5	Cartref	10
Glencoe	10	Glencoe	5	Wasbank	5		
Clovelly	5	Clovelly	5				

Cartref	5	Cartref	5			
Mispah	5	Swartland	5			

The geology of this vegetation type is characterised by the Pretoria group and the Witwatersrand Subgroup quartzite ridges as well as the Rooiberg Group Selons River Formation which is from the Transvaal Supergroup. The parent geology from this vegetation type supports shallow soils like Glenrosa and Mispah which typically forms on slopes and ridges where topsoil is likely to wash off (Mucina & Rutherford, 2006).

### Climate

This region is characterised by a strongly seasonal rainfall, dry winters and a mean annual precipitation of approximately 726 mm and is relatively uniform across the distribution of the Gm 12 vegetation type (Mucina & Rutherford, 2006). Incidence of frost ranges between 13 to 42 days a year and occurs more at higher elevations, see Figure Error! No text of specified style in document.-10.

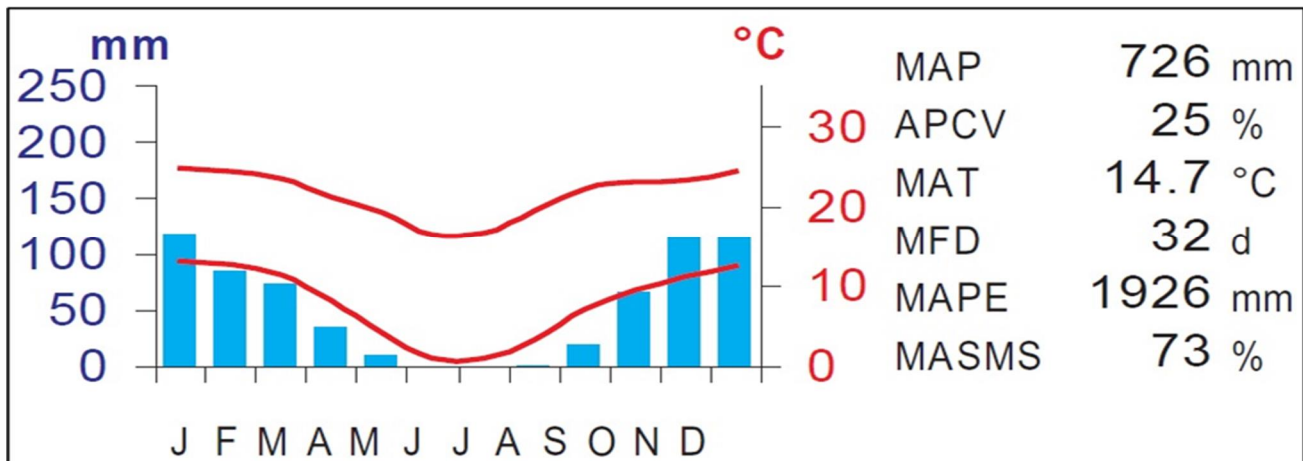


Figure Error! No text of specified style in document.-10. Climate for the project area (Mucina & Rutherford, 2006).

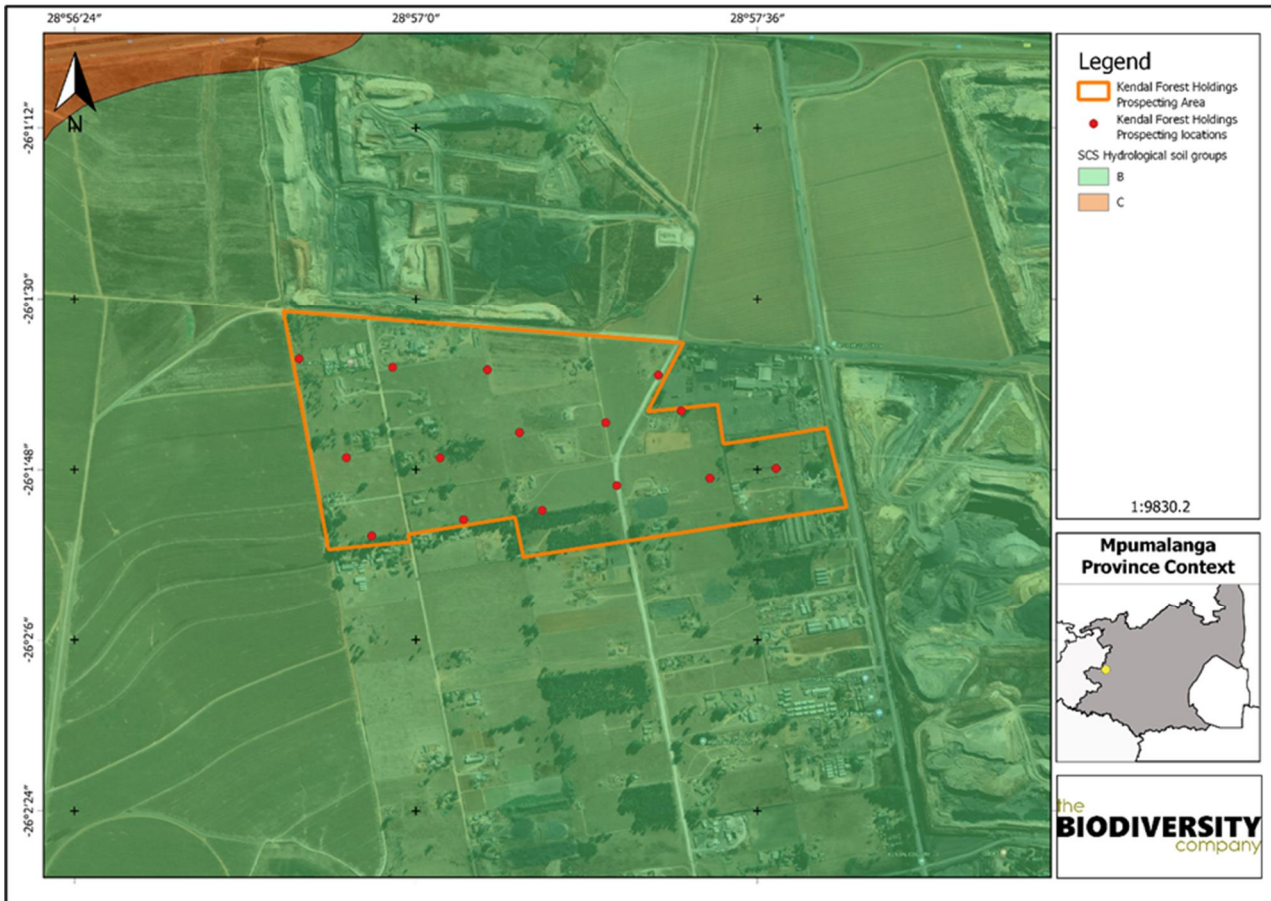
### Soil Conservation Services (SCS) Hydrological Soil Groups

Soil properties has been categorised hydrologically by the Soil Conservation Services (SCS) into four basic groups i.e., A, B, C and D. Their characteristics are summarised in Figure Error! No text of specified style in document.-7 as per SANRAL (2013).

Table Error! No text of specified style in document.-7. Characteristics of the four basic SCS hydrological soil groups

Soil Group A	<i>Low stormflow potential.</i> Infiltration is high and permeability is rapid in this group. Overall drainage is excessive to well-drained (Final infiltration rate $\approx$ 25 mm/h. Permeability rate $>$ 7.6 mm/h).
Soil Group B	<i>Moderately low stormflow potential.</i> The soils of this group are characterised by moderate infiltration rates, effective depth and drainage. Permeability is slightly restricted (Final infiltration rate $\approx$ 13 mm/h. Permeability rate 3.8 to 7.6 mm/h).
Soil Group C	<i>Moderately high stormflow potential.</i> The rate of infiltration is slow or deteriorates rapidly in this group. Permeability is restricted. Soil depth tends to be shallow (Final infiltration rate $\approx$ 6 mm/h. Permeability rate 1.3 to 3.8 mm/h).
Soil Group D	<i>High stormflow potential.</i> Soils in this group are characterised by very low infiltration rates and severely restricted permeability. Very shallow soils and those of high shrink-swell potential are included in this group (Final infiltration rate $\approx$ 3 mm/h. Permeability rate $<$ 1.3 mm/h).

The project area falls in soil group B, meaning the soil has a moderately low stormflow potential (Figure Error! No text of specified style in document.-11).



**Figure Error! No text of specified style in document.-11. The SCS hydrological soil group associated with the project area.**

**(b) Description of the current land uses.**

The various plots are used for differing purposes. The table below describes the uses for each plot:

Plot Number	Land Use
3	Business Use (Hardware)
4	Business Use (Truck Rest and Fuel Pump)
19	Historical Residence
21	Residence
22	Residence
23	Coal Stockyard
38	Residence and Historical Farming
39	Residence
40	Residence
41	Residence
42	Residence
57	Business Use (Mechanical Workshop)
58	Residence
59	Residence
60	Residence

61	Residence
77	Business ( Mine Offices)
78	Residence
79	Residence
80	Residence

**(c) Description of specific environmental features and infrastructure on the site.**

Infrastructure on site varies from plot to plot. As presented in the table below infrastructure descriptions are provided:

<b>Plot Number</b>	<b>Infrastructure</b>
3	Hardware sales building on Eastern portion of property
4	Various buildings used for Business (Truck Rest and Fuel Pump) on eastern and western sides of plot
19	Historical Residence: ruins of a home
21	Residence: Home with large, scraped area.
22	Residence: home & outbuildings
23	Coal Stockyard & buildings
38	Unoccupied Residence and Historical Farming
39	Residence: home & outbuildings
40	Residence: home & outbuildings
41	Residence: home & outbuildings
42	Residence: home & outbuildings
57	Business Use (Mechanical Workshop)
58	Residence: home & outbuildings
59	Residence: home & outbuildings
60	Residence: home & outbuildings
61	Residence: home & outbuildings
77	Business ( Mine Offices)
78	Residence: home & outbuildings
79	Residence: home & outbuildings
80	Residence: home & outbuildings

**(d) Environmental and current land use map.**

(Show all environmental, and current land use features)

The current land use varies from plot to plot. The plan below illustrates the degree of modification of land within the prospecting application area relative to the MTPA of 2014.





**v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

**Planning Phase**

The impacts in the planning phase are minimal as it would be mainly initial site surveys. Only one possible impact was considered:

- Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.

**Construction Phase**

The following potential impacts on the biodiversity were considered for the construction phase of the proposed prospecting. This phase refers to the period when the drill and associated infrastructure will be set up. This phase is considered to have the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered:

- Destruction of, and fragmentation of, portions of the vegetation communities classified as EN;
- Loss of poorly protected and VU ecosystem;
- Displacement of faunal community due to habitat loss, disturbance (noise, dust and vibration) and/or direct mortalities; and
- Encroachment by alien invasive species.

These impacts were combined for each drill site to evaluate the impact on the relevant features of each.

**Operational Phase**

The following potential impacts were considered on biodiversity (fauna and flora) during operational phase:

- Continued encroachment and displacement of the vegetation communities (EN) and due to alien invasive plant species;
- Further loss of poorly protected and VU ecosystems;
- Continued displacement and fragmentation of the faunal community (including SCCs) due to ongoing anthropogenic disturbances (noise, traffic and dust); and
- Potential leaks from the water collections and portable toilets into the surrounding environment.

A combination of the impacts relevant to each site was assessed.

## **Decommissioning and Rehab Phase**

The following potential impacts were considered on terrestrial fauna and vegetation communities:

- Continued encroachment and displacement of an EN vegetation community by alien invasive plant species and erosion;
- Continued displacement of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances and habitat degradation (litter, road mortalities and/or poaching).

The impacts were envisioned to be similar for the drill sites and as such they were assessed collectively.

### **vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;**

Potential impacts were evaluated against the data captured during the desktop assessment to identify relevance to the project area. The relevant impacts were then subjected to a prescribed impact assessment methodology. The details of this methodology can be provided on request.

## **Terrestrial Impact Assessment**

### **Assessment of Significance**

The assessment of impact significance considers pre-mitigation as well as implemented of post-mitigation scenarios. The mitigation actions required to lower the risk of the impact are provided in Section 9.1.6 of this report.

### **Planning Phase**

The planning phase is regarded as temporary, and if conducted on foot the significance of the impact could be reduced from ~~Low~~ to ~~Absent~~ (Table Error! No text of specified style in document.-8).

### **Construction Phase**

Table Error! No text of specified style in document.-9 summarises the significance of potential impacts associated with the development on biodiversity before and after implementation of mitigation measures. Prior to implementation of mitigation measures the significance of impact to the EN vegetation community were rated as ~~Moderately-High~~ due to the importance of this type and number of SCCs likely to occur. Implementation of mitigation measures could reduce the impact to ~~Moderate~~. The significance of the displacement of fauna due to disturbance and/or direct mortalities was rated as ~~Moderately-High~~ prior to implementation of mitigation measures. The implementation of mitigation measures such as walking through the area prior to construction could reduce this impact to ~~Moderate~~.

### **Operational Phase**

Table Error! No text of specified style in document.-10 summarises the significance of the operational phase impacts on biodiversity before and after implementation of mitigation measures. The impact significance of

potential leaks was rated as ~~A~~Moderate prior to mitigation. Implementation of mitigation measures reduced the significance of the impact to an ~~A~~Absent level.

### Decommissioning Phase

Table Error! No text of specified style in document.-11 shows the impacts associated with the decommissioning and rehabilitation of the drill sites. Should the rehabilitation be done successfully, the impacts significance would be %Absent

### vii) 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.

**Table Error! No text of specified style in document.-8. Planning phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles	1	2	2	3	3		1	1	1	3	1	
	One day to one month: Temporary	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / /important	Likely	Low	One day to one month: Temporary	Activity specific / < 5 ha impacted / Linear features affected < 100m	Insignificant / ecosystem structure and function unchanged	Ecology moderately sensitive / /important	Highly unlikely	Absent

**Table Error! No text of specified style in document.-9. Construction phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Destruction of, and fragmentation of, portions of the vegetation	4	4	3	3	4		3	3	4	4	3	
	Life of operation or less than 20 years:	Regional within 5 km of the site bound	Significant / ecosystem structure and function	Ecology moderately sensitive / /important	Highly likely	Modera tely High	One year to five years : Medi	Local area/ within 1 km of the site bound	Great / harmful / ecosystem structure and	Ecology highly sensitive /important	Likely	Modera te

<b>communities classified as EN</b>	Long Term	ary / < 2000h a impacted / Linear features affected < 3000 m	n moderately altered					um Term	ary / < 5000h a impacted / Linear features affected < 1000 m	function largely altered				
	4	4	3	3	4			3	3	2	2	2		
<b>Loss of poorly protected and VU ecosystem</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000h a impacted / Linear features affected < 3000 m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive / important	Highly likely	<b>Moderately High</b>		One year to five years : Medium Term	Local area/ within 1 km of the site boundary / < 5000h a impacted / Linear features affected < 1000 m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	<b>Low</b>	
	4	4	4	3	4			3	3	4	4	2		
<b>Displacement of faunal community due to habitat loss, disturbance (noise, dust and vibration) and/or direct mortalities</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000h a impacted / Linear features affected < 3000 m	Great / harmful / ecosystem structure and function largely altered	Ecology moderately sensitive / important	Highly likely	<b>Moderately High</b>		One year to five years : Medium Term	Local area/ within 1 km of the site boundary / < 5000h a impacted / Linear features affected < 1000 m	Great / harmful / ecosystem structure and function largely altered	Ecology highly sensitive / important	Possible	<b>Moderate</b>	
	4	4	4	3	4			3	3	2	3	2		
<b>Encroachment by alien invasive species</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000h a impacted / Linear features affected <	Great / harmful / ecosystem structure and function largely altered	Ecology moderately sensitive / important	Highly likely	<b>Moderately High</b>		One year to five years : Medium Term	Local area/ within 1 km of the site boundary / < 5000h a impacted / Linear features affected <	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Possible	<b>Low</b>	

		3000 m						1000 m			
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**Table Error! No text of specified style in document.-10. Operational phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
<b>Continued encroachment and displacement of the vegetation communities (EN) and due to alien invasive plant species</b>	4	4	4	4	4		2	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000 m	Great / harmful / ecosystem structure and function largely altered	Ecology highly sensitive / important	Highly likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Possible	<b>Low</b>
<b>Further loss of poorly protected and VU ecosystems</b>	4	4	4	4	3		2	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000 m	Great / harmful / ecosystem structure and function largely altered	Ecology highly sensitive / important	Likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Possible	<b>Low</b>
<b>Continued displacement and fragmentation of the faunal community (including SCCs) due to ongoing anthropo</b>	4	4	4	3	3		2	2	2	2	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear featur	Great / harmful / ecosystem structure and function largely altered	Ecology moderately sensitive / important	Likely	<b>Moderate</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/ importance	Possible	<b>Absent</b>

<b>genic disturbances (noise, traffic and dust)</b>		es affected < 3000 m											
	4	4	4	3	3			2	2	2	2	2	
<b>Potential leaks from the water collections and portable toilets into the surrounding environment</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000 m	Great / harmful / ecosystem structure and function largely altered	Ecology moderately sensitive / important	Likely	<b>Moderate</b>		One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	<b>Absent</b>

**Table Error! No text of specified style in document.-11. Decommissioning phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
<b>Continued encroachment and displacement of an EN vegetation community by alien invasive plant species and erosion</b>	4	4	4	3	4		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000 m	Great / harmful / ecosystem structure and function largely altered	Ecology moderately sensitive / important	Highly likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Highly unlikely	<b>Absent</b>
<b>Continued displacement of the faunal community (including threatened or protected species) due to</b>	4	4	4	3	3		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha	Great / harmful / ecosystem structure and function	Ecology moderately sensitive / important	Likely	<b>Moderate</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive / important	Highly unlikely	<b>Absent</b>

ongoing anthropogenic disturbances and habitat degradation (litter, road mortalities and/or poaching)	impact ed / Linear features affected < 3000 m	largely altered					features affected < 100m			
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## Pedology Impact Assessment

Some of the drill sites were placed in more sensitive undisturbed area, while others are found on/adjacent to roads in less sensitive areas. Table Error! No text of specified style in document.-12 shows the anticipated impacts associated with the prospecting activities on the soil based on desktop data. The methodology used can be made available on request.

### **Table Error! No text of specified style in document.-12. Anticipated impacts for the proposed prospecting on agricultural resources and soil**

Main Impact	Project activities that can cause loss/impacts to habitat	Secondary impacts anticipated
Loss of land capability	<ul style="list-style-type: none"> <li>• Construction, operation and decommissioning of possible access roads</li> <li>• Construction, operation and decommissioning of temporary camp</li> <li>• Construction, operation and decommissioning of drill sites</li> <li>• Soil Stripping; and</li> <li>• Mixing of soil</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion;</li> <li>• Soil degradation;</li> <li>• Compaction;</li> <li>• Increase in salinity;</li> <li>• Land contamination; and</li> <li>• Loss of soil via aeolian processes.</li> </ul>

## Planning Phase

The planning phase for the construction and operation of prospecting will lead to compaction and erosion of soil resources due to the increase of traffic.

The pre- and post- mitigation significance ratings have been scored 'Negligible . Negativeq(Table Error! No text of specified style in document.-13).

## Construction Phase

The construction phase for the proposed prospecting will lead to compaction and erosion of soil resources due to altered surface dynamics, the increased volume of traffic and general degradation of soil resources, which could result in the loss of land capability.

It is however worth noting that limited impacts are expected for the construction phase. The pre- and post-mitigation significance ratings have been scored 'Negligible . Negativeq(Table Error! No text of specified style in document.-13).

### • Operational Phase

The operational phase will lead to compaction and erosion of soil resources due to the sheer weight of the drill machinery and the cleared areas will also increase the likelihood of storm water run off and erosion.

It is however worth noting that some impacts are expected for the operational phase. The pre- and post-mitigation significance ratings have been scored ~~Minor~~ . Negative and ~~Negligible~~ . Negative respectively (Table Error! No text of specified style in document.-13).

### Decommissioning and Rehabilitation Phase

The decommissioning and rehabilitation phase will lead to compaction and erosion of soil resources predominantly due to increased traffic associated with rehabilitation which could result in the loss of land capability.

It is however worth noting that limited impacts are expected for the rehabilitation phase aspects. The pre- and post- mitigation significance ratings have been scored ~~Negligible~~ . Negative (Table Error! No text of specified style in document.-13).

**Table Error! No text of specified style in document.-13 Impact assessment for the proposed prospecting activities during the planning, construction, operation, decommissioning and rehabilitation phase**

Phase	Impact	Pre-mitigation						Post-mitigation					
		Duration	Extent	Intensity	Consequence	Probability	Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Planning	Loss of land capability	Immediate	Very limited	Very low - negative	Negligible	Improbable	Negligible - negative	Immediate	Very limited	Very low - negative	Negligible	Highly unlikely	Negligible - negative
Construction	Loss of land capability	Short term	Site-specific	Moderately high - negative	Slightly detrimental	Probable	Negligible - negative	Short term	Site-specific	Moderate - negative	Slightly detrimental	Unlikely	Negligible - negative
Operational	Loss of land capability	Beyond project life	Site-specific	Moderately high - negative	Moderately detrimental	Probable	Minor - negative	Beyond project life	Site-specific	Moderate - negative	Moderately detrimental	Unlikely	Negligible - negative
Decommissioning and Rehabilitation	Loss of land capability	Medium term	Site-specific	Low - negative	Slightly detrimental	Improbable	Negligible - negative	Medium term	Site-specific	Low - negative	Slightly detrimental	Highly unlikely	Negligible - negative

### viii) The possible mitigation measures that could be applied and the level of risk.

#### Terrestrial Ecology Mitigation Actions

The focus of mitigation measures should be to reduce the significance of potential impacts associated with the exploration and thereby to:

- Prevent the unnecessary destruction of, and fragmentation, of the EN vegetation community (Including a VU ecosystem); and
- Prevent the loss of the faunal community associated with these vegetation communities.

From a desktop perspective the project area is regarded as moderate-high sensitive. The areas in which the drill sites fall are mostly similar, from the desktop assessment. The assumption of the sensitivity is based on the EN vegetation type, the VU ecosystem (including its poorly protected level), the number of SCCs that could possibly



occur and the disturbed nature of the surrounding areas that would have made these areas a green space. Prescribed mitigation and rehabilitation measures include the following:

- Drilling sites must be located in already disturbed areas;
- Drill sites must be rehabilitated to the pre-drill land use and condition;
- Selected drilling sites should also be adjacent to existing access routes to avoid the construction of new routes. Alternatively, in the event new routes are required these should be established in already disturbed areas and kept to an absolute minimum with regards to width and length;
- The Contractor should inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities;
- The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility;
- Where a registered disposal facility is not available close to the project area, the Contractor must provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site;
- Refuse bins must be emptied and secured;
- Temporary storage of domestic waste must be in covered waste skips;
- Maximum domestic waste storage period will be 10 days;
- The areas where exploration is to take place must be specifically demarcated so that only the demarcated areas be impacted upon and preventing movement of workers into surrounding environments;
- Areas that are denuded need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species;
- No materials may not be stored for extended periods of time and must be removed from the site once the construction/closure phase has been concluded;
- The area must be walk through prior to construction to chase up any animals that could be hiding in burrows or under vegetation. Should burrows be identified, the ECO must ensure that the animals have moved out of it, as they will most likely be hiding out due to the noise, before construction can begin;
- A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna that is found during construction (including all reptiles and amphibians);
- Dust reducing mitigation measures must be put in place and must be strictly adhered to, during the construction and operational phase of the project;
- A storm water management plan must be put in place and implemented to reduce the likelihood of erosion;
- Leaking equipment must be repaired immediately or be removed from the site to facilitate repair;
- The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site;
- All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages;
- All contaminated soil / yard stone must be treated *in situ* or removed and be placed in containers;

- All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements;
- A temporary fence must be placed around the drill sites to ensure no animals can fall into the hole while the process is still ongoing;
- Drilling at night must be prohibited in order to reduce the impact on faunal species;
- An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasives on cleared areas, monitoring must be done on a monthly basis by the ECO for the duration of the project and then as stated in the management plan;
- A spill management plan must be put in place to ensure that should the water spill out into the surrounding area during the drilling process this does not result in erosion;
- Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type; and
- The sites must be rehabilitated after they have been refilled and sealed, the sites must be rehabilitated progressively as the process moves from one site to the other.

### **Pedology Mitigation Actions**

The main aim of the mitigations is to ensure that closure and rehabilitation can be done successfully at the end of the prospecting. The following mitigations are suggested:

- Areas stripped must be revegetated to restrict erosion;
- Prioritise prospecting during the dry season (May to August) to avoid erosion of bare areas caused by run-off;
- Ensure proper storm water management designs are in place;
- Compacted areas are to be ripped to loosen the soil structure;
- Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks;
- Leaking vehicles will have drip trays place under them where the leak is occurring; and
- Only the designated access routes are to be used to reduce any unnecessary compaction.

### **ix) Motivation where no alternative sites were considered.**

No site alternative has been considered as no infrastructure is planned and the option of re-siting bore hole positions will have negligible effect on the impact ratings.

### **x) Statement motivating the alternative development location within the overall site.**

This is not applicable as no site development alternatives have been considered. The initial drill site locations have been selected by the project geologist but final siting will be done in liaison with property owners and or occupiers where applicable.

**i) 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.**

The following process was undertaken to identify and describe the potential environmental risks associated with the proposed prospecting right:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify significant ecological, botanical and faunal features within the proposed development areas;
- Identification of conservation significant habitats around the project area which might be impacted by the proposed development;
- Conducting a desktop pedology assessment which includes a description of the physical properties which characterise the soil within the proposed project area;
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application; and
- Suggest possible impacts, mitigation and rehabilitation measures to prevent or reduce the possible impacts.



**j) Assessment of each identified potentially significant impact and risk**

<b>NAME OF ACTIVITY</b>  (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc  E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etcõ etcõ etc.)	<b>POTENTIAL IMPACT</b>  (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etcõ .etcõ )	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	<b>SIGNIFICANCE if not mitigated</b>	<b>MITIGATION TYPE</b>  (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	<b>SIGNIFICANCE if mitigated</b>
See Impact Assessment Tables in Section VII above.						



**k) Summary of specialist reports.**

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.
Terrestrial Ecology and Pedology Desktop Report for the Mwelase Prospecting Right Application . The Biodiversity Company 2021	Terrestrial Ecology From a desktop perspective the project area is regarded as moderate-high sensitive. The areas in which the drill sites fall are mostly similar, from the desktop assessment. The assumption of the sensitivity is based on the EN vegetation type, the VU ecosystem (including its poorly protected level), the number of SCCs that could possibly occur and the disturbed nature of the surrounding areas that would have made these areas a green space. Fieldwork will confirm the state of the habitat and determine what species of fauna is present at the sites, this will allow for a more comprehensive impact study with supporting mitigation measures.	X	Section 10.1 on Page 50 of the specialist Report
	Pedology It is apparent from the desktop assessment that the project area is characterised by freely drained soils, predominantly Hutton and Avalon soils. Negligible-negative+final significance ratings are expected for the various phases of the project. These impact ratings are preliminary and will be revisited once baseline information has been acquired.	X	Section 10.2 on Page 50 of the specialist Report
Heritage Assessment: Notification of Intent to Develop and Request for Exemption	The proposed prospecting boreholes and associated activities will not affect any existing, tangible heritage resources. Impacts on fossil heritage are highly unlikely. There remains an inevitable risk that subsurface heritage resources may be exposed during construction. The potential that significant subsurface heritage resources are present is, however, very unlikely.  A Basic Assessment process is required to obtain necessary Environmental Authorisation for the PRA. This process in turn requires a heritage resources management (HRM) process in terms of section 38(8) of the NHRA.	X	Section 6 on page 10 of the specialist Report

	<p>Amber Earth requested the Heritage Foundation to undertake the HRM process, limited to this NID and RfE. The document was prepared following site screening and a brief desktop review of available heritage reports. The Heritage Foundation undertook site screening to record the current state of the landscape.</p> <p>Based on the relatively small scale of the proposed development, the low significance of the geology in terms of fossil sensitivity and the absence of visible, recorded surface heritage resources, it is recommended that exemption be granted from all further heritage studies for this project.</p>		
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Attach copies of Specialist Reports as appendices: See Appendix 4.



## I) Environmental impact statement

### (i) Summary of the key findings of the environmental impact assessment;

#### Terrestrial Ecology

From a desktop perspective the project area is regarded as moderate-high sensitive. The areas in which the drill sites fall are mostly similar, from the desktop assessment. The assumption of the sensitivity is based on the EN vegetation type, the VU ecosystem (including its poorly protected level), the number of SCCs that could possibly occur and the disturbed nature of the surrounding areas that would have made these areas a green space. Fieldwork will confirm the state of the habitat and determine what species of fauna is present at the sites, this will allow for a more comprehensive impact study with supporting mitigation measures.

#### Pedology

It is apparent from the desktop assessment that the project area is characterised by freely drained soils, predominantly Hutton and Avalon soils. Negligible-negative+final significance ratings are expected for the various phases of the project. These impact ratings are preliminary and will be revisited should additional prospecting be planned in future.

### (ii) Final Site Map

The final site layout includes only bore hole positions as no infrastructure is planned to be placed in site.

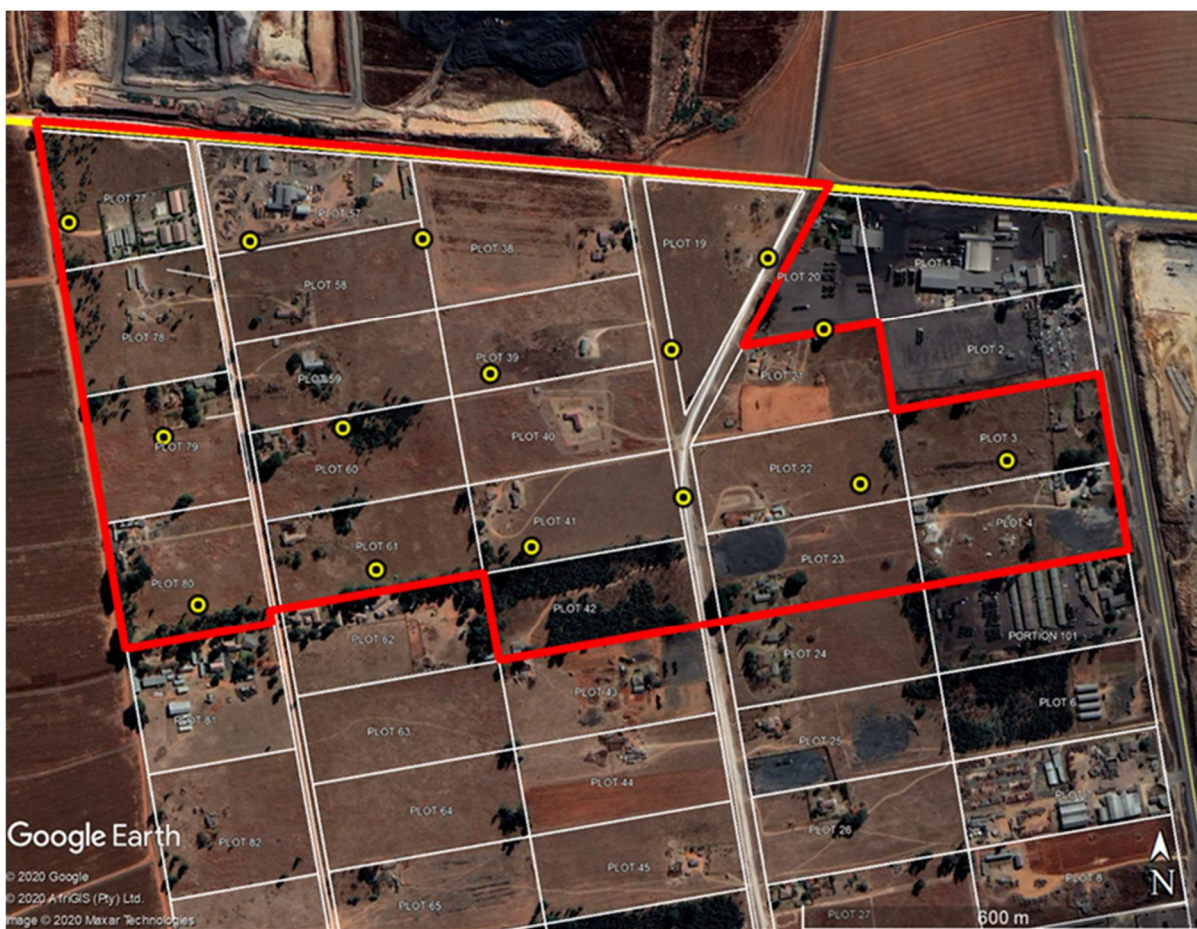


Figure 4. Positions of initial bore hole locations.

### **(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;**

#### Positive Impacts:

Positive Socio-economic impacts are limited to the job-creation during the prospecting process. No Positive Environmental Impacts have been identified.

#### Negative Impacts:

Potential negative impacts identified during the impact assessment process include the following:

- Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.
- Destruction of, and fragmentation of, portions of the vegetation communities classified as EN;
- Loss of poorly protected and VU ecosystem;
- Displacement of faunal community due to habitat loss, disturbance (noise, dust and vibration) and/or direct mortalities; and
- Encroachment by alien invasive species.
- Continued displacement and fragmentation of the faunal community (including SCCs) due to ongoing anthropogenic disturbances (noise, traffic and dust); and
- Potential leaks from the water collections and portable toilets into the surrounding environment.

#### Identified Alternatives:

No site alternative has been considered as no infrastructure is planned and the option of re-siting bore hole positions will have negligible effect on the impact ratings.

### **m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;**

The management objective associated with this impact assessment and its associated EMPr include the following:

- Implementation of all mitigation measures
- Rehabilitation of bore hole sites including the capping and/or plugging of each bore hole.
- Drill site rehabilitation to pre-prospecting status.

### **n) Aspects for inclusion as conditions of Authorisation.**

It is recommended that the following be included as conditions of authorisation:

- Drilling sites must be located in already disturbed areas;
- Drill sites must be rehabilitated to the pre-drill land use and condition;
- Selected drilling sites should also be adjacent to existing access routes to avoid the construction of new routes. Alternatively, in the event new routes are required these should be established in already disturbed areas and kept to an absolute minimum with regards to width and length;
- The Contractor should inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities;
- The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility;
- Where a registered disposal facility is not available close to the project area, the Contractor must provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site;
- Refuse bins must be emptied and secured;
- Temporary storage of domestic waste must be in covered waste skips;

- Maximum domestic waste storage period will be 10 days;
- The areas where exploration is to take place must be specifically demarcated so that only the demarcated areas be impacted upon and preventing movement of workers into surrounding environments;
- Areas that are denuded need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species;
- No materials may not be stored for extended periods of time and must be removed from the site once the construction/closure phase has been concluded;
- The area must be walk through prior to construction to chase up any animals that could be hiding in burrows or under vegetation. Should burrows be identified, the ECO must ensured that the animals have moved out of it, as they will most likely be hiding out due to the noise, before construction can begin;
- A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna that is found during construction (including all reptiles and amphibians);
- Dust reducing mitigation measures must be put in place and must be strictly adhered to, during the construction and operational phase of the project;
- A storm water management plan must be put in place and implemented to reduce the likelihood of erosion;
- Leaking equipment must be repaired immediately or be removed from the site to facilitate repair;
- The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site;
- All vehicles and equipment must be well maintained to ensure that there are no oil or fuel leakages;
- All contaminated soil / yard stone must be treated *in situ* or removed and be placed in containers;
- All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements;
- A temporary fence must be placed around the drill sites to ensure no animals can fall into the hole while the process is still ongoing;
- Drilling at night must be prohibited in order to reduce the impact on faunal species;
- An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasives on cleared areas, monitoring must be done on a monthly basis by the ECO for the duration of the project and then as stated in the management plan;
- A spill management plan must be put in place to ensure that should the water spill out into the surrounding area during the drilling process this does not result in erosion;
- Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type; and

- The sites must be rehabilitated after they have been refilled and sealed, the sites must be rehabilitated progressively as the process moves from one site to the other.

**o) Description of any assumptions, uncertainties and gaps in knowledge.**

Although not known at this stage, there is a possibility that grave sites may exist. These are heritage sites and must be avoided. The drilling team must liaise with the landowner and/or occupier to ensure any selected drilling sites do not impact on any heritage resources.

**p) Reasoned opinion as to whether the proposed activity should or should not be authorised**

**i) Reasons why the activity should be authorized or not.**

The specialist assessment as well as the EAP have not identified any fatal flaws with regard to the proposed prospecting activity.

**ii) Conditions that must be included in the authorisation**

See Section N above.

**q) Period for which the Environmental Authorisation is required.**

The Applicant is applying for Environmental Authorisation for five (5) Years

**r) Undertaking**

The applicant confirms that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

**s) Financial Provision**

The financial provision associated with the rehabilitation of bore holes is a relatively simple assessment. The post closure target is to leave a drill site where no risk to persons/animals exist due to a collapsed bore hole collar/cap and where the topsoil is left in a state where natural re-growing of the grass cover is possible. The financial provision required is as follows:

<b>DMRE Ref No</b>	<b>Farm Name</b>	<b>Farm Number</b>	<b>Portions</b>	<b>Recommended Financial Provisioning</b>
(MP) 16645PR	Heuvelfontein	215 IR	Re	41 bore holes R44,075.00

**i) Explain how the aforesaid amount was derived.**

The Financial Provision calculation is based on real on-site experience of bore hole and drill site rehabilitation which is incorporated into the table below.

<b>Task</b>	<b>Rate</b>
Supervisor	R350.00/hr – rehabilitation = 2hrs/bore hole
Land Surveyor	Not Required
Back-actor (topsoil replacement & re-shaping of roads and tracks)	The drill footprint area will not require a Back-actor (TLB).
Tractor & scarifier (access tracks)	The access route will not require scarifying
Equipment Transport	No heavy equipment will be required for bore hole site rehabilitation
Bore hole Capping	R200.00/hole
Fertilizer	No fertilizing will be required due to the short duration the drill rig will be on site.
Seeding	No seeding is anticipated due to the short duration that drill rig will be on site.
Rehabilitation Monitoring	R350.00/hr – monitoring = 0,5hrs/bore hole
Rehabilitation Cost per bore hole	R1075.00/bore hole

**ii) Confirm that this amount can be provided for from operating expenditure.**

This rehabilitation cost (R1075/bore hole) forms part of the operational cost estimate as illustrated in Table 3 of the Prospecting Work Programme.

**t) Specific Information 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:-**

**(1) Impact on the socio-economic conditions of any directly affected person.**

The process of prospecting through diamond core drilling processes will not impact on the socio-economic conditions of the landowners and/or occupiers. The Applicant's drilling team must liaise with each landowner and/or occupier regarding the final position of the bore hole as well as access to the position.

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

The proposed prospecting boreholes and associated activities will not affect any existing, tangible heritage resources. Impacts on fossil heritage are highly unlikely. There remains an inevitable risk that subsurface heritage resources may be exposed during construction. The potential that significant subsurface heritage resources are present is, however, very unlikely.

A Basic Assessment process is required to obtain necessary Environmental Authorisation for the PRA. This process in turn requires a heritage resources management (HRM) process in terms of section 38(8) of the NHRA.

Amber Earth requested the Heritage Foundation to undertake the HRM process, limited to this NID and RfE. The document was prepared following site screening and a brief desktop review of available heritage reports. The Heritage Foundation undertook site screening to record the current state of the landscape.

Based on the relatively small scale of the proposed development, the low significance of the geology in terms of fossil sensitivity and the absence of visible, recorded surface heritage resources, it is recommended that exemption be granted from all further heritage studies for this project.

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

No site alternative has been considered as no infrastructure is planned on site and the option of re-siting bore hole positions will have negligible effect on the impact ratings.

# PART B

## ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### 1) Draft environmental management programme.

- a) **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).

Please see Part A of this BAR.

b) **Description of the Aspects of the Activity**

This is already included in Part A of this BAR.

c) **Composite Map**

See Appendix 2

d) **Description of Impact management objectives including management statements**

i) **Determination of closure objectives.**

The management objective associated with this impact assessment and its associated EMP include the following:

- Implementation of all mitigation measures
- Rehabilitation of bore hole sites including the capping and/or plugging of each bore hole.
- Drill site rehabilitation to pre-prospecting status.

ii) **Volumes and rate of water use required for the operation.**

Potable Water:

The drilling team will provide their own potable water on site sourced from off-site.

Ablution Facilities:

Chemical toilets will be used on site requiring no additional water source.

Drilling Water Needs:

Diamond Core drilling required a limited amount of water per bore hole. An average of 5kl of water will be used per bore hole. This water will be sourced by the drilling contractor prior to drilling and not from the prospecting holes being drilled.

iii) **Has a water use licence has been applied for?**

No Section 21 water uses are triggered by the proposed prospecting activities therefore no water use license is required.





iv) Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc</p>	<p>(of operation in which activity will take place.  State; Planning and design, Pre-Construction Construction, Operational, Rehabilitation, Closure, Post closure).</p>		<p>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(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)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
All prospecting	Planning and Design and pre-construction	0 ha disturbed	None Required	NA	NA
Drill site access	Planning and Design and pre-construction	Applicable to each drill site individual access route	Selected drilling sites should also be adjacent to existing access routes to avoid the construction of new routes. Alternatively, in the event new routes are required these should be established in already disturbed areas and kept to an absolute minimum with regards to width and length;	Duty of care in terms of the NEMA	Throughout preparation of drill sites, during drilling operations, closure and rehabilitation of drill sites.
Drill Site	Construction and operational Phases	Approx. 115m <sup>2</sup>	Drilling sites must be located in already disturbed areas; Areas stripped must be revegetated to restrict erosion; Prioritise prospecting during the dry season (May to August) to avoid	Duty of care in terms of the NEMA	Throughout preparation of drill sites, during drilling operations, closure and rehabilitation of drill sites.

			<p>erosion of bare areas caused by run-off;          Ensure proper storm water management designs are in place;          Compacted areas are to be ripped to loosen the soil structure;          Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks;          Leaking vehicles will have drip trays place under them where the leak is occurring; and          Only the designated access routes are to be used to reduce any unnecessary compaction.</p>		
On-Site Chemical Toilet	Construction and operational Phases	Approx 2m <sup>2</sup>	The Contractor should inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities;	Duty of care in terms of the NEMA	Throughout preparation of drill sites, during drilling operations, closure and rehabilitation of drill sites.
Waste Management	Construction, operational and closure phases	All 88 ha	<p>The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility;          Where a registered disposal facility is not available close to the project area, the Contractor must provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site;          Refuse bins must be emptied and secured;          Temporary storage of domestic waste must be in covered waste skips;          Maximum domestic waste storage period will be 10 days;</p>	Duty of care in terms of the NEMA	Throughout preparation of drill sites, during drilling operations, closure and rehabilitation of drill sites.

## e) Impact Management Outcomes

### Planning phase impacts to the terrestrial biodiversity

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Temporary disturbance of wildlife due to increased human presence and possible use of machinery and/or vehicles.	1	2	2	3	3		1	1	1	3	1	
	One day to one month: Temporary	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Likely	<b>Low</b>	One day to one month: Temporary	Activity specific/ < 5 ha impacted / Linear features affected < 100m	Insignificant / ecosystem structure and function unchanged	Ecology moderately sensitive/ /important	Highly unlikely	<b>Absent</b>

### Construction phase impacts to the terrestrial biodiversity

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Destruction of, and fragmentation of, portions of the vegetation communities classified as EN	4	4	3	3	4		3	3	4	4	3	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted /	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Likely	<b>Moderate</b>

		Linear features affected < 3000m						impacted / Linear features affected < 1000m				
	4	4	3	3	4		3	3	2	2	2	
<b>Loss of poorly protected and VU ecosystem</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Significant / ecosystem structure and function moderately altered	Ecology moderately sensitive/ /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	<b>Low</b>
	4	4	4	3	4		3	3	4	4	2	
<b>Displacement of faunal community due to habitat loss, disturbance (noise, dust and vibration) and/or direct mortalities</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology moderately sensitive/ /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Possible	<b>Moderate</b>
	4	4	4	3	4		3	3	2	3	2	
<b>Encroachment by alien invasive species</b>	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology moderately sensitive/ /important	Highly likely	<b>Moderately High</b>	One year to five years: Medium Term	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	<b>Low</b>

**Operational phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
<b>Continued encroachment and displacement of the vegetation communities (EN) and due to alien invasive plant species</b>	4	4	4	4	4		2	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Highly likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	<b>Low</b>
<b>Further loss of poorly protected and VU ecosystems</b>	4	4	4	4	3		2	2	2	3	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology highly sensitive /important	Likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Possible	<b>Low</b>
<b>Continued displacement and fragmentation of the faunal community (including SCCs) due to ongoing anthropogenic disturbances (noise, traffic and dust)</b>	4	4	4	3	3		2	2	2	2	2	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology moderately sensitive/ /important	Likely	<b>Moderate</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology with limited sensitivity/importance	Possible	<b>Absent</b>
<b>Potential leaks from the water collections and portable toilets into</b>	4	4	4	3	3		2	2	2	2	2	
	Life of operation or less	Regional within 5 km of the site	Great / harmful/ ecosystem	Ecology moderately	Likely	<b>Moderate</b>	One month to one year:	Development specific/ within the site	Small / ecosystem structure and	Ecology with limited sensitivity/importance	Possible	<b>Absent</b>

the surrounding environment	than 20 years: Long Term	boundary / < 2000ha impacted / Linear features affected < 3000m	structure and function largely altered	sensitive/ /important			Short Term	boundary / < 100 ha impacted / Linear features affected < 100m	function largely unchanged			
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**Decommissioning phase impacts to the terrestrial biodiversity**

Impact	Prior to mitigation						Post mitigation					
	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance	Duration of Impact	Spatial Scope	Severity of Impact	Sensitivity of Receiving Environment	Probability of Impact	Significance
Continued encroachment and displacement of an EN vegetation community by alien invasive plant species and erosion	4	4	4	3	4		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology moderately sensitive/ /important	Highly likely	<b>Moderately High</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	<b>Absent</b>
Continued displacement of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances and habitat degradation (litter, road mortalities and/or poaching).	4	4	4	3	3		2	2	2	3	1	
	Life of operation or less than 20 years: Long Term	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Great / harmful/ ecosystem structure and function largely altered	Ecology moderately sensitive/ /important	Likely	<b>Moderate</b>	One month to one year: Short Term	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Small / ecosystem structure and function largely unchanged	Ecology moderately sensitive/ /important	Highly unlikely	<b>Absent</b>

***Pedology: Impact assessment for the proposed prospecting activities during the planning, construction, operation, decommissioning and rehabilitation phase***

Phase	Impact	Pre-mitigation						Post-mitigation					
		Duration	Extent	Intensity	Consequence	Probability	Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
<b>Planning</b>	Loss of land capability	Immediate	Very limited	Very low - negative	Negligible	Improbable	Negligible - negative	Immediate	Very limited	Very low - negative	Negligible	Highly unlikely	Negligible - negative
<b>Construction</b>	Loss of land capability	Short term	Site-specific	Moderately high - negative	Slightly detrimental	Probable	Negligible - negative	Short term	Site-specific	Moderate - negative	Slightly detrimental	Unlikely	Negligible - negative
<b>Operational</b>	Loss of land capability	Beyond project life	Site-specific	Moderately high - negative	Moderately detrimental	Probable	Minor - negative	Beyond project life	Site-specific	Moderate - negative	Moderately detrimental	Unlikely	Negligible - negative
<b>Decommissioning and Rehabilitation</b>	Loss of land capability	Medium term	Site-specific	Low - negative	Slightly detrimental	Improbable	Negligible - negative	Medium term	Site-specific	Low - negative	Slightly detrimental	Highly unlikely	Negligible - negative





## f) Impact Management Actions

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Drill site preparation	Surface disturbance	Minimise surface area disturbance by demarcating the drill site area	Implementation during pre-construction and operational phase. Rehabilitation immediately upon cessation of drilling	NEMA Duty of Care
Drill site access road for drill rig and LDV\$	Surface disturbance and topsoil compaction	Selection of least impact route through liaison with land owner.	Implementation during pre-construction and operational phase. Rehabilitation immediately upon cessation of drilling	NEMA Duty of Care
Drilling Operations	Waste Management	Ensure waste management related mitigation measures are implemented on site	Implementation during pre-construction and operational phase. Rehabilitation immediately upon cessation of drilling	NEMA Duty of Care
Drilling Operations	Spillage or leaking of any HCS	Ensure site is equipped with a drip tray and spill kit.	Implementation during pre-construction and operational phase. Rehabilitation immediately upon cessation of drilling	NEMA Duty of Care
Drill Site Rehabilitation	Increased and unnecessary surface disturbance	Conduct as much rehabilitation work on foot or with only LDV access. Ensure all solid waste is removed from site and disposed of correctly.	Implementation during the Rehabilitation Phase	NEMA Duty of Care
Drill site access	Dust emissions and road degradation	Inspection of access roads and implementation of dust suppression with a water bowser if required	Full period of on-site prospecting	NEMA Duty of Care



i) **Financial Provision**

(1) **Determination of the amount of Financial Provision.**

(a) **Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

The closure objective associated with this impact assessment and its associated EMPr include the following:

- Implementation of all mitigation measures during all applicable phases in order to support the closure objectives of this site.
- Rehabilitation of bore hole sites including the capping and/or plugging of each bore hole.
- Drill site rehabilitation to pre-prospecting status.

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

These closure objectives have been included in the draft Basic Assessment Report (this report) for public consultation will all registered IAPs.

(c) **Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.**

This is not applicable to this prospecting right application since the only invasive aspect of this prospecting right application is the drilling of bore holes. Implementation of the rehabilitation of bore holes as described in the mitigation measures will ensure that no residual prospecting areas will remain at the time of closure.

(d) **Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

The closure objectives have been described in conjunction with the rehabilitation plan and cannot function independently. The rehabilitation plan

seeks to meet each closure objective in order to satisfy the DMRE that closure has been reached while achieving a pre-prospecting status.

**(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

The financial provision associated with the rehabilitation of bore holes is a relatively simple assessment. The post closure target is to leave a drill site where no risk to persons/animals exist due to a collapsed bore hole collar/cap and where the topsoil is left in a state where natural re-growing of the grass cover is possible. The financial provision required is as follows:

<b>DMRE Ref No</b>	<b>Farm Name</b>	<b>Farm Number</b>	<b>Portions</b>	<b>Recommended Financial Provisioning</b>
(MP) 16645PR	Heuvelfontein	215 IR	Re	41 bore holes R44,075.00

**(f) Confirm that the financial provision will be provided as determined.**

The applicant has committed to the financial provision as determined in this BAR within the operational budget of the prospecting programme.

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

- g) Monitoring of Impact Management Actions
- h) Monitoring and reporting frequency
- i) Responsible persons
- j) Time period for implementing impact management actions
- k) 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
Construction and Operational phase	Surface disturbance Spillages Ablution facilities Waste management Drilling water	Site inspection by ECO	Physical on-site inspection and written report on findings.	Monthly during construction and operational phases
Closure and Decommissioning Phase	Drill footprint state Evidence of any residue Any remaining drill related waste on site Bore hole capping/plugging Rehabilitation of drill footprint	Site inspection by ECO	Physical on-site inspection and written report on findings.	Monthly during construction and operational phases



**l) Indicate the frequency of the submission of the performance assessment/ environmental audit report.**

An annual Performance Assessment Reports will be submitted to the DMRE.

**m) Environmental Awareness Plan**

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

**Induction Programme:** An Induction Programme, which will include the environmental awareness programme, will be established for the prospecting area in question. During the training sessions various topics will be discussed such as, but not limited to: Water Pollution Prevention, Good Environmental Housekeeping, spill protection and clean up etc. Through the Induction Programme, the mine manager safety officer, or any other responsible appointed person shall ensure that all staff receives training in:

- Administrative requirements and procedures, which will include the Environmental Emergency Procedures.
- Resource conservation, environmental reporting and general environmental awareness for mine related environmental issues.

All employees (including contractor employees) will undergo induction. This induction includes training and awareness on environmental issues within the prospecting area and is compulsory for all new employees. The induction programme will as mentioned above, have an environmental management component. On an annual basis, the environmental section of the induction will be updated to ensure all prospecting components adhere to applicable environmental legislation. Consideration should be given to:

- Significant environmental impacts as identified in the BAR & EMP;
- Environmental awareness and emergency procedures
- Trends in incidents;
- Trends in audit findings;

**Trainee needs:** The identification of environmental training and environmental awareness needs are derived from an analysis of the different roles that employees play at the mine. The following categories are considered:

- Senior Management
- Middle management (Environmental Officers)
- Supervisors
- Operators
- Visitors and contractors

Each of these categories has different responsibilities and therefore has different knowledge requirements and environmental awareness training needs to obtain that knowledge.

**(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

The contractor on site is responsible for the ultimate implementation of all mitigation measures as described in this EMP. For this reason communication of these objectives and mitigation measures should be clear and regular. Site inspections by the project ECO must determine compliance with these mitigation measures as well as effectiveness of such.

**n) Specific information required by the Competent Authority**

The applicant confirms that the Financial Provision will be reviewed annually and submitted to the DMRE.



## 2) UNDERTAKING

The EAP herewith confirms

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



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Signature of the environmental assessment practitioner:

Amber Earth Pty Ltd

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Name of company:

17 February 2021

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Date:

**-END-**

**The following Appendices are provided:**

Appendix 1: EAP CV

Appendix 2: Regulation 2.2 Plan and Site Plan

Appendix 3: Public Consultation Report

Appendix 4: Specialist Studies