



Ecological Desktop Assessment for the proposed Prospecting Right Application on Portion 2 of Blesbokfontein 31 IS

OGIES, MPUMALANGA PROVINCE

CLIENT: MAKHONYA MINERALS AND RESOURCES

11 NOVEMBER 2022

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Table of Contents

1	Introduction.....	6
1.1	Aim and objectives	6
2	Key Legislative Requirements	6
2.1	International Legislation and Policy	6
2.2	National Legislation	7
2.3	National Policy and Guidelines	7
2.4	Provincial and Municipal Level	7
2.5	Structure of the Report.....	8
3	Description of the Project Area	9
3.1.1	Climate.....	11
3.1.2	Landtype Soils	11
4	Approach.....	11
4.1	Flora	11
4.2	Fuana.....	11
4.3	Wetland Assessment	12
4.4	Buffer Determination	12
5	Limitations and Assumptions	13
6	Expertise of the Specialist	13
7	Results and Discussion	13
7.1	Desktop Assessment	13
7.1.1	Regional Vegetation.....	13
7.1.2	Fauna	17
7.1.3	National Wetlands Map 5.....	20
7.1.4	Mpumalanga Highveld Wetlands.....	23
7.1.5	Ecosystem Status	24
7.1.6	Important Bird Areas.....	27
7.1.7	Protected Areas	27
7.1.8	Mpumalanga Biodiversity Sector Plan (2014).....	27
7.1.9	Land Uses	29

8	Impact Assessment.....	31
8.1	Potential Impacts.....	31
8.2	Identification of Impacts.....	32
8.2.1	Potential Impacts to Vegetation Communities	33
8.2.2	Potential Impacts to Faunal Communities	34
8.2.3	Potential Impacts to Wetlands	34
8.3	Assessment of Significance.....	34
8.3.1	Significance of Impacts on Vegetation Communities	34
8.3.2	Significance of Impacts on Faunal Communities	34
8.3.3	Significance of Impacts on Wetlands	34
8.4	Water Resources Buffer Requirement	37
8.5	Recommendations.....	38
8.6	Mitigation Measures	38
9	Opinion of the Specialist	39
9.1	Conditions for Environmental Authorisation	39
10	Conclusion.....	39
11	References.....	41

Tables

Table 7-1: Vegetation Status.....	14
Table 7-2: Dominant Plant Species.....	14
Table 7-3: Ecologically Significant Plant Taxa that may be found in the project area	16
Table 7-4: The possible mammal species occurring within the project area	17
Table 7-5: Avifaunal species that may occur within the project area	18
Table 7-6: The possible herpetofauna within the project area	18
Table 8-1: Likelihood descriptors.....	31
Table 8-2: Consequence Descriptors	31
Table 8-3: Significance Rating Matrix.....	32
Table 8-4: Impacts identified for the proposed project.....	33

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Table 8-5: Assessment of significance of potential impacts on vegetation communities associated with the proposed project	35
Table 8-6: Assessment of significance of potential impacts on faunal communities associated with the proposed project	35
Table 8-7: Assessment of significance of potential impacts on wetlands associated with the proposed project	36
Table 8-8: Buffer zone determination	37

Figures

Figure 3-1: Location of the Project Area	10
Figure 3-2: Climate diagram (Mucina and Rutherford, 2006)	11
Figure 7-1: The regional vegetation associated with the proposed project	15
Figure 7-2: The NFEPA Wetlands associated with the project area	22
Figure 7-3: The Mpumalanga Highveld wetlands associated with the project area..	23
Figure 7-4: Threat status of ecosystems within the project area	25
Figure 7-5: Protection status of ecosystems within the project area	26
Figure 7-6: The Mpumalanga Biodiversity Sector Plan areas within the project area.	28
Figure 7-7: Land uses identified within the project area.....	30

Declaration

I Ndumiso Ian Dlamini, as duly authorised representative of 9ZeroSeven Environmental, hereby confirm my independence and declare that I:

- ❖ I act as the independent specialist in this application;
- ❖ I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- ❖ I declare that there are no circumstances that may compromise my objectivity in performing such work;
- ❖ I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- ❖ I will comply with the Act, regulations and all other applicable legislation;
- ❖ I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- ❖ I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- ❖ all the particulars furnished by me in this form are true and correct; and
- ❖ I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Signature of the specialist:	<i>Ndumiso N.T. Dlamini</i>
Designation:	Ecologist (Pr. Sci. Nat.)
Qualifications:	BSc Life and Environmental Sciences (UJ) BSc Hons Botany (UJ)
Experience (years):	Eight (8)
Date:	1 September 2022

1 Introduction

9ZeroSeven (907) Environmental was commissioned to conduct a desktop ecological assessment for the proposed Makhonya Minerals and Resources (Makhonya) Mining Application. The desktop assessment is to support the Prospecting Right Application for the mining of coal on the farm Blesbokfontein 31 IS in the Mpumalanga Province.

This report presents the results of a desktop ecological assessment completed for the proposed Prospecting Right Application. This report should be interpreted after taking into consideration the findings and recommendations provided by the specialist herein. Further, this report should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed project.

1.1 Aim and objectives

As part of this assessment, the following objectives were established:

- ❖ The desktop characterisation of ecological areas within the project area;
- ❖ The desktop delineation of freshwater ecosystems within the proposed project area;
- ❖ The desktop delineation of land types within the proposed project area
- ❖ The desktop delineation of vegetation units within the proposed project area
- ❖ The desktop evaluation of the extent of site-related effects in terms of selected ecological indicators;
- ❖ An impact assessment for the proposed project; and
- ❖ The prescription of mitigation measures and recommendations for the identified impacts.

2 Key Legislative Requirements

The legislation, policies and guidelines listed below are applicable to the current project in terms of biodiversity and ecological support systems. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Explanation of certain documents or organisations is provided where these have a high degree of relevance to the project and/or are referred to in this assessment.

2.1 International Legislation and Policy

- ❖ Convention on Biological Diversity (Rio de Janeiro, 1992);
- ❖ The Ramsar Convention (on wetlands of international importance);
- ❖ The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival; and

- ❖ The IUCN (World Conservation Union). The IUCN's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable

2.2 National Legislation

- ❖ Constitution of the Republic of South Africa (Act 108 of 1996). The Bill of Rights, in the Constitution of South Africa states that everyone has a right to a nonthreatening environment and requires that reasonable measures be applied to protect the environment. This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development;
- ❖ The National Environmental Management Act (NEMA) No. 107 of 1998; Ecological Assessment Regulations, 2014. Specifically, the requirements of the specialist report as per the requirements of Appendix 6;
- ❖ The National Environmental Management: Biodiversity Act (NEM:BA) No. 10 of 2004: specifically, the management and conservation of biological diversity within the RSA and of the components of such biological diversity;
- ❖ National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations;
- ❖ National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003);
- ❖ National Water Act, 1998 (Act 36 of 1998);
- ❖ Environmental Conservation Act, 1989 (ECA), (Act no. 73 of 1989);
- ❖ National Forests Act, 1998 (Act 84 of 1998), specifically with reference to Protected Tree species;
- ❖ National Heritage Resources Act, 1999 (Act 25 of 1999);
- ❖ Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

2.3 National Policy and Guidelines

- ❖ South Africa's National Biodiversity Strategy and Action Plan (NBSAP);
- ❖ National Spatial Ecological Assessment (NSBA); and
- ❖ National Freshwater Ecosystem Priority Areas (NFEPA's).

2.4 Provincial and Municipal Level

In addition to national legislation, South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996).

- ❖ Mpumalanga Biodiversity Sector Plan (2014).

2.5 Structure of the Report

Aspect	Section
The person who prepared the report; and the expertise of that person to carry out the specialist study or specialised process.	Section 6
A declaration that the person is independent	Page viii
An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 4
A description of any assumptions made and any uncertainties or gaps in knowledge	Section 5
(f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 7 and Section 7.1.9
Recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority	Section 8.5, Section 9 and Section 0
A description of any consultation process that was undertaken during the course of carrying out the study	N/A
A summary and copies of any comments that were received during any consultation process	N/A
Any other information requested by the competent authority.	N/A

3 Description of the Project Area

The project area is the entirety of Portion 2 of the farm Blesbokfontein 31 IS within the Ogies area in the Mpumalanga Province as presented in Figure 3-1. The project area is located approximately 24km south-west of eMalahleni and 12km south-east from Ogies.

The project is situated within within the B11F Quaternary Catchments within the Olifants Management Area. The Olifants WMA is mainly occupied by the South African portion of the Olifants River catchment, excluding the Letaba River catchment. The Letaba River catchment is a tributary catchment to the Limpopo Basin shared by South Africa, Botswana, Zimbabwe and Mozambique. The Olifants River originates to the east of Johannesburg, initially flowing northwards before gently curving eastwards towards the Kruger National Park, where it is met at the confluence with the Letaba River before flowing into Mozambique. The climate varies greatly from the cool Highveld in the south to subtropical, east of the escarpment. The region has a mean annual precipitation rate of 500 to 800 mm. Diverse economic activity includes mining, metallurgic industries, irrigation, dryland and subsistence agriculture, and ecotourism. The provision of water to meet ecological requirements in the Olifants River is one of the controlling factors in the management of water resources throughout the WMA. Several large dams control much of the flow in these rivers. The Olifants WMA receives substantial amounts of water from transfers to serves as cooling water for power generation, while smaller transfers are made to neighbouring WMAs (StatsSA, 2010).

The land uses within the local area is predominantly low density, semi-rural residential areas, agriculture and transformed grasslands. Mining activities are well established in the region and local areas.

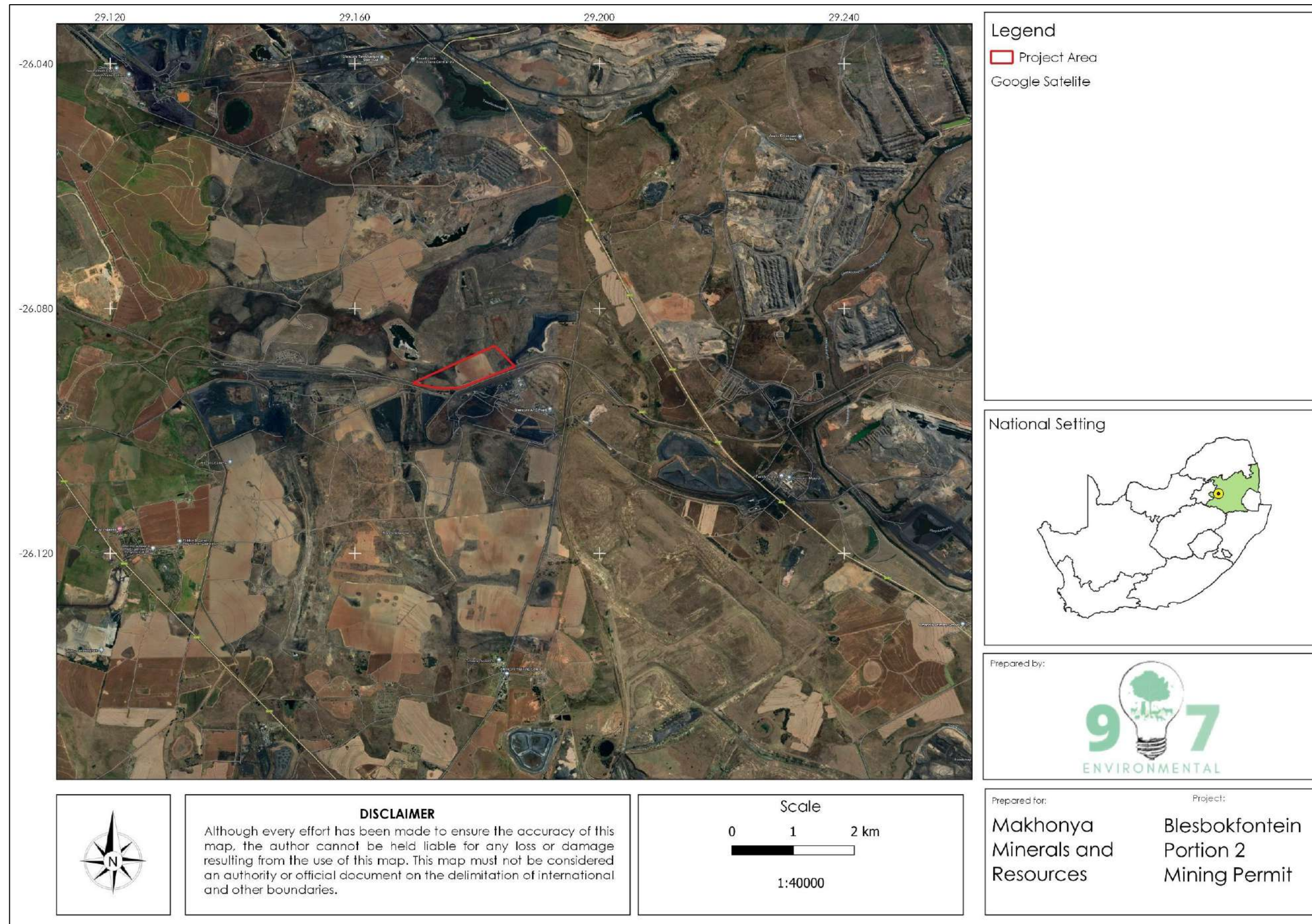


Figure 3-1: Location of the Project Area

3.1.1 Climate

The project falls within a strongly seasonal summer rainfall, with very dry winters. MAP 650–900 mm (overall average: 726 mm), MAP relatively uniform across most of this unit, but increases significantly in the extreme southeast. The coefficient of variation in MAP is 25% across most of the unit but drops to 21% in the east and southeast. Incidence of frost from 13–42 days, but higher at higher elevations. The climate diagram for the area is presented in Figure 3-2.

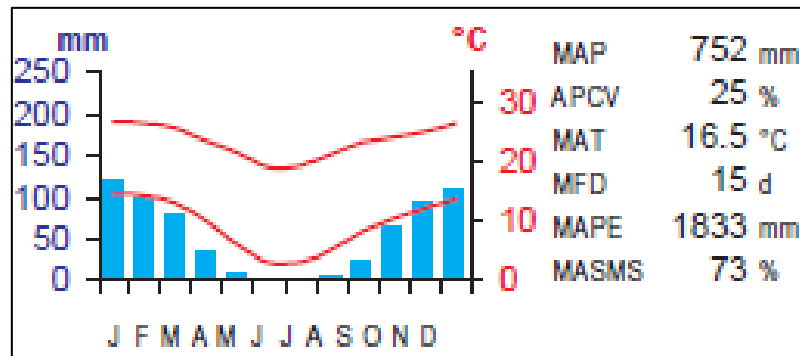


Figure 3-2: Climate diagram (Mucina and Rutherford, 2006)

3.1.2 Landtype Soils

The geology of the area is comprised of Karoo Supergroup rocks in Vryheid Formation of the Eccca group.

The soils within the project area are highly variable in-depth characteristics, with relatively small areas of rocky outcrop and ferricrete exposure. Deeper areas of soil are associated with the cultivated lands. The soils are generally moderate to low clay soils with low reserves of organic carbon and resultant high potential erodibility on the sedimentary derived soils.

4 Approach

A desktop study was undertaken, aiming to identify:

4.1 Flora

- ❖ Potential species in the site area according to the South African National Biodiversity Institute (SANBI);
- ❖ Potential Red Data species and their current status; and
- ❖ Expected vegetation type and community structure, (Mucina and Rutherford 2006 and 2018).

4.2 Fauna

- ❖ The SIBIS online interactive species distribution map was used to obtain data for the distribution of mammals, reptiles, amphibians and terrestrial invertebrates within the greater study area. Data was acquired for the Quarter Degree Squares (QDS) in which the study is located;

- ❖ The potential occurrence of mammals was supplemented by the species distribution maps in Friedman and Daly (2004), and Smithers (2002);
- ❖ Lists of birds found in the Quarter Degree Square (QDS) for the study area were determined using online data from the South African Bird Atlas Project (SABAP 2) for 2012;
- ❖ The Convention on International Trade of Endangered Species (CITES) species database;
- ❖ The IUCN Red-Data List for South African fauna;
- ❖ The International IUCN Red-Data List, and;
- ❖ National Environmental Management Biodiversity Act (NEMBA 10 of 2004) listed species. steve

4.3 Wetland Assessment

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) was considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels. In addition, the method also includes the assessment of structural features at the lower levels of classification (Ollis *et al*, 2013). The following datasets and resources were utilised for the desktop assessment:

- ❖ Information as presented by the South African National Biodiversity Institutes (SANBI's) Biodiversity Geographic Information Systems (BGIS) website (<http://bgis.sanbi.org>);
- ❖ Aerial imagery (Google Earth Pro);
- ❖ Land Type Data (Land Type Survey Staff 1972 - 2006)
- ❖ The National Freshwater Ecosystem Priority Areas (Nel, et al. 2011);
- ❖ Contour data (5m).

4.4 Buffer Determination

A buffer zone is defined as "A strip of land with a use, function or zoning specifically designed to protect one area of land against impacts from another." (Macfarlane, et al., 2014).

Buffer zones protect water resources in a variety of ways, such as;

- ❖ Maintenance of basic aquatic processes;
- ❖ The reduction of impacts on water resources from activities and adjoining land uses;
- ❖ The provision of habitat for aquatic and semi-aquatic species;
- ❖ The provision of habitat for terrestrial species; and
- ❖ The provision of societal benefits.

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane, et al., 2014) was used to determine the appropriate buffer zone for the proposed activity.

5 Limitations and Assumptions

The following assumptions and limitations are applicable to this report:

- ❖ The study is limited to a desktop assessment of the project area;
- ❖ All delineations are based on aerial imagery; and
- ❖ The lack of information regarding the activities to be completed on the site, only allowed for a general assessment on the impacts and the buffer requirement.

6 Expertise of the Specialist

Ndumiso Dlamini obtained his BSc Hons degree in Botany in 2011 at the University of Johannesburg and is a registered Pr. Sci. Nat with SACNASP (116579) in Botanical Science and Ecological Science. Ndumiso has been conducting biodiversity, ecological and water resources assessments as an Environmental Consultant for over 8 years. He has performed numerous ecological impact assessments for various projects which include mining, housing developments, roads and infrastructure and rehabilitation. A detailed CV can be made available on request.

7 Results and Discussion

7.1 Desktop Assessment

A high-level desktop assessment was conducted to identify key environmental features within 500m of the project area.

7.1.1 Regional Vegetation

The project area was located Eastern Highveld Grassland vegetation unit as presented in Figure 7-1 (Mucina & Rutherford, 2018).

The vegetation unit is found throughout the Mpumalanga and Gauteng provinces. The landscape is dominated by moderately undulating plains at altitudes that range between 1520m – 1780m. The status of the vegetation, as at the time of publishing (2006), is summarised in Table 7-1 and the dominant plant species within the vegetation unit are shown in Table 7-2.

This vegetation type occurs on 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 (*Arsitida*, *Digitaria*, *Erafrostsia*, *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).

Table 7-1: Vegetation Status

Vegetation Name	Ecological Status	Conservation Status	% of Project Area
Eastern Highveld Grassland	Largely Modified	Endangered	100%

Table 7-2: Dominant Plant Species

Vegetation Unit	Dominant Plant Species
Eastern Highveld Grassland	<i>Andropogon shirensis</i> , <i>Cynodon dactylon</i> , <i>Eragrostis curvula</i> , <i>Eragrostis plan</i> , <i>Harpachloa falx</i> <i>Aristida congesta</i> <i>Sporobulus africana</i> , <i>Panicum natalense</i> , <i>Themeda triandra</i>

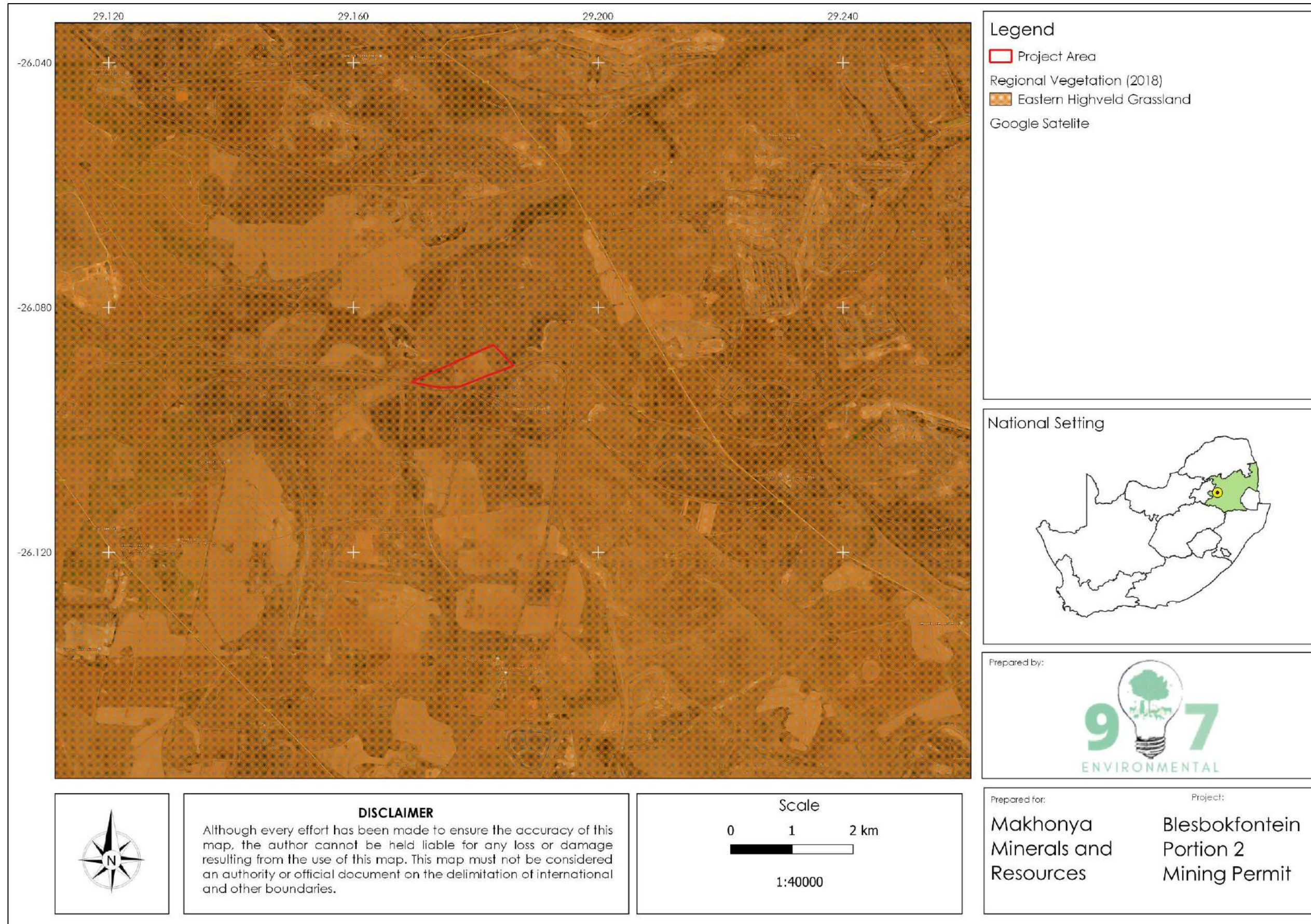


Figure 7-1: The regional vegetation associated with the proposed project

Makhonya Minerals and Resources - Blesbokfontein Portion 2

The Plants of Southern Africa (POSA) Database was utilised to obtain a list of plant species that could occur within the project area. The plant list of ecologically significant plant species is presented in Table 7-3.

Table 7-3: Ecologically Significant Plant Taxa that may be found in the project area

Family	Species	Conservation status
Acanthaceae	<i>Dicliptera magaliesbergensis</i> K.Balkwill	VU
Amaryllidaceae	<i>Boophone disticha</i> (L.f.) Herb.	Declining
Amaryllidaceae	<i>Crinum macowanii</i> Baker	Declining
Anacardiaceae	<i>Searsia gracillima</i> (Engl.) Moffett var. <i>gracillima</i>	NT
Apocynaceae	<i>Ceropegia turricula</i> E.A.Bruce	NT
Apocynaceae	<i>Stenostelma umbelluliferum</i> (Schltr.) S.P.Bester & Nicholas	NT
Apocynaceae	<i>Ceropegia decidua</i> E.A.Bruce subsp. <i>pretoriensis</i> R.A.Dyer	VU
Aquifoliaceae	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	Declining
Asphodelaceae	<i>Trachyandra erythrorrhiza</i> (Conrath) Oberm.	NT
Asphodelaceae	<i>Aloe peglerae</i> Schönland	EN
Asteraceae	<i>Gnaphalium nelsonii</i> Burtt Davy	Rare
Asteraceae	<i>Callilepis leptophylla</i> Harv.	Declining
Crassulaceae	<i>Adromischus umbraticola</i> C.A.Sm. subsp. <i>umbraticola</i>	NT
Crassulaceae	<i>Kalanchoe longiflora</i> Schltr. ex J.M.Wood	VU
Cucurbitaceae	<i>Cucumis humifructus</i> Stent	VU
Fabaceae	<i>Argyrolobium campicola</i> Harms	NT
Fabaceae	<i>Argyrolobium megarrhizum</i> Bolus	NT
Fabaceae	<i>Pearsonia bracteata</i> (Benth.) Polhill	NT
Fabaceae	<i>Acacia erioloba</i> E.Mey.	Declining
Fabaceae	<i>Melolobium subspicatum</i> Conrath	VU
Hyacinthaceae	<i>Drimia sanguinea</i> (Schinz) Jessop	NT
Hyacinthaceae	<i>Drimia altissima</i> (L.f.) Ker Gawl.	Declining
Hyacinthaceae	<i>Bowiea volubilis</i> Harv. ex Hook.f. subsp. <i>volubilis</i>	VU
Hypoxidaceae	<i>Hypoxis hemerocallidea</i> Fisch., C.A.Mey. & Avé-Lall.	Declining
Mesembryanthemaceae	<i>Gibbaeum petrense</i> (N.E.Br.) Tischer	VU
Mesembryanthemaceae	<i>Drosanthemum micans</i> (L.) Schwantes	EN
Orchidaceae	<i>Habenaria bicolor</i> Conrath & Kraenzl.	NT

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Family	Species	Conservation status
Orchidaceae	<i>Habenaria kraenzliniana</i> Schltr.	NT
Orchidaceae	<i>Holothrix randii</i> Rendle	NT
Poaceae	<i>Festuca dracomontana</i> H.P.Linder	VU
Proteaceae	<i>Leucospermum cordifolium</i> (Salisb. ex Knight) Fourc.	NT
Rhizophoraceae	<i>Cassipourea malosana</i> (Baker) Alston	Declining
Zamiaceae	<i>Encephalartos friderici-guilielmi</i> Lehm.	NT
Zamiaceae	<i>Encephalartos lehmannii</i> Lehm.	NT
Zamiaceae	<i>Encephalartos horridus</i> (Jacq.) Lehm.	EN

7.1.2 Fauna

7.1.2.1 Mammals

The assessment for mammal species was conducted at desktop level to determine the probability of occurrence of faunal species. The potential species that may occur within the project area are listed in Table 7-4. It must be noted that the possible species list is at desktop level and may include species that were previously recorded in the area and may possibly be no longer occurring within the project area such as Elephants for example.

Table 7-4: The possible mammal species occurring within the project area

Family	Scientific name	Common name	Conservation Status
Bathyergidae	<i>Cryptomys hottentotus</i>	Southern African Mole-rat	LC
Cercopithecidae	<i>Cercopithecus albogularis</i>	Samango Monkey	
Cercopithecidae	<i>Papio ursinus</i>	Chacma Baboon	LC
Elephantidae	<i>Loxodonta africana</i>	African Bush Elephant	LC
Gliridae	<i>Graphiurus (Graphiurus) murinus</i>	Forest African Dormouse	LC
Herpestidae	<i>Herpestes sanguineus</i>	Slender Mongoose	LC
Muridae	<i>Mastomys natalensis</i>	Natal Mastomys	LC
Muridae	<i>Otomys angoniensis</i>	Angoni Vlei Rat	LC
Muridae	<i>Otomys auratus</i>	Southern African Vlei Rat	NT
Muridae	<i>Rattus rattus</i>	Roof Rat	LC
Mustelidae	<i>Mellivora capensis</i>	Honey Badger	LC
Nycteridae	<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	LC
Rhinolophidae	<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat	LC
Rhinolophidae	<i>Rhinolophus cohenae</i>	Cohen's Horseshoe Bat	VU
Rhinolophidae	<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat	LC
Rhinolophidae	<i>Rhinolophus swinnyi</i>	Swinny's Horseshoe Bat	VU

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Family	Scientific name	Common name	Conservation Status
Soricidae	<i>Crocidura flavescens</i>	Greater Red Musk Shrew	LC
Soricidae	<i>Crocidura silacea</i>	Lesser Gray-brown Musk Shrew	LC
Soricidae	<i>Myosorex varius</i>	Forest Shrew	LC
Soricidae	<i>Suncus lixus</i>	Greater Dwarf Shrew	LC
Soricidae	<i>Suncus varilla</i>	Lesser Dwarf Shrew	LC
Vespertilionidae	<i>Miniopterus sp.</i>	Long-fingered Bats	
Vespertilionidae	<i>Miniopterus fraterculus</i>	Lesser Long-fingered Bat	LC
Vespertilionidae	<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	LC
Vespertilionidae	<i>Myotis tricolor</i>	Temminck's Myotis	LC
Vespertilionidae	<i>Neoromicia capensis</i>	Cape Serotine	LC

7.1.2.2 Avifauna

A desktop avifaunal investigation was conducted to determine the bird species that may occur within the project area. A total number of bird species is expected to occur within the project may be made available on request; however, a total of 11 were considered to be of conservation concern as listed in Table 7-5.

Table 7-5: Avifaunal species that may occur within the project area

Common name	Species name	Conservation Status
Swallow, Blue	<i>Hirundo atrocaerulea</i>	CR
Stork, Black	<i>Ciconia nigra</i>	NT
Secretarybird, Secretarybird	<i>Sagittarius serpentarius</i>	NT
Falcon, Lanner	<i>Falco biarmicus</i>	NT
Eagle, African Crowned	<i>Stephanoaetus coronatus</i>	NT
Kingfisher, Half-collared	<i>Alcedo semitorquata</i>	NT
Ground-thrush, Orange	<i>Zoothera gurneyi</i>	NT
Warbler, Broad-tailed	<i>Schoenicola brevirostris</i>	NT

7.1.2.3 Herpetofauna

The herpetofauna survey consisted of a desktop study. The desktop study determined that the species listed in Table 7-6 could occur within the project area. There were no herpetofauna of conservation concern expected for the project area.

Table 7-6: The possible herpetofauna within the project area

Family	Scientific name	Common name	Conservation Status
Reptiles			
Agamidae	<i>Agama atra</i>	Southern Rock Agama	LC
Chamaeleonidae	<i>Bradypodion transvaalense</i>	Wolkberg Dwarf Chameleon	LC

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Family	Scientific name	Common name	Conservation Status
Chamaeleonidae	<i>Chamaeleo dilepis</i>	Common Flap-neck Chameleon	LC
Colubridae	<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	LC
Colubridae	<i>Dasypeltis inornata</i>	Southern Brown Egg-eater	LC
Colubridae	<i>Philothamnus hoplogaster</i>	South Eastern Green Snake	LC
Colubridae	<i>Philothamnus natalensis occidentalis</i>	Western Natal Green Snake	LC
Cordylidae	<i>Chamaesaura anguina anguina</i>	Cape Grass Lizard	LC
Cordylidae	<i>Cordylus vittifer</i>	Common Girdled Lizard	LC
Cordylidae	<i>Platysaurus sp.</i>		LC
Cordylidae	<i>Platysaurus orientalis orientalis</i>	Sekhukhune Flat Lizard	LC
Cordylidae	<i>Pseudocordylus melanotus melanotus</i>	Common Crag Lizard	LC
Cordylidae	<i>Smaug vandami</i>	Van Dam's Girdled Lizard	LC
Elapidae	<i>Dendroaspis polylepis</i>	Black Mamba	LC
Elapidae	<i>Naja annulifera</i>	Snouted Cobra	LC
Gekkonidae	<i>Homopholis wahlbergii</i>	Wahlberg's Velvet Gecko	LC
Gekkonidae	<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	LC
Gekkonidae	<i>Lygodactylus nigropunctatus</i>	Black-spotted Dwarf Gecko	LC
Gekkonidae	<i>Lygodactylus ocellatus</i>	Spotted Dwarf Gecko	LC
Gekkonidae	<i>Pachydactylus vansonii</i>	Van Son's Gecko	LC
Gerrhosauridae	<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	LC
Gerrhosauridae	<i>Tetradactylus breyeri</i>	Breyer's Long-tailed Seps	LC
Lacertidae	<i>Nucras lalandii</i>	Delalande's Sandveld Lizard	LC
Lamprophiidae	<i>Amplorhinus multumaculatus</i>	Many-spotted Snake	LC
Lamprophiidae	<i>Aparallactus capensis</i>	Black-headed Centipede-eater	LC
Lamprophiidae	<i>Duberria lutrix lutrix</i>	South African Slug-eater	LC
Lamprophiidae	<i>Inyoka swazicus</i>	Swazi Rock Snake	LC
Lamprophiidae	<i>Lycodonmorphus inornatus</i>	Olive House Snake	LC
Lamprophiidae	<i>Lycodonmorphus laevisissimus</i>	Dusky-bellied Water Snake	LC
Lamprophiidae	<i>Lycodonmorphus rufulus</i>	Brown Water Snake	LC

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Family	Scientific name	Common name	Conservation Status
Lamprophiidae	<i>Prosymna stuhlmannii</i>	East African Shovel-snout	LC
Lamprophiidae	<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	LC
Lamprophiidae	<i>Psammophis crucifer</i>	Cross-marked Grass Snake	LC
Lamprophiidae	<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	LC
Lamprophiidae	<i>Pseudaspis cana</i>	Mole Snake	LC
Leptotyphlopidae	<i>Leptotyphlops scutifrons conjunctus</i>	Eastern Thread Snake	LC
Scincidae	<i>Panaspis wahlbergi</i>	Wahlberg's Snake-eyed Skink	LC
Scincidae	<i>Scelotes mirus</i>	Montane Dwarf Burrowing Skink	LC
Scincidae	<i>Trachylepis punctatissima</i>	Speckled Rock Skink	LC
Scincidae	<i>Trachylepis striata</i>	Striped Skink	LC
Scincidae	<i>Trachylepis varia sensu lato</i>	Common Variable Skink Complex	LC
Typhlopidae	<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	LC
Frogs			
Brevicipitidae	<i>Breviceps adspersus</i>	Bushveld Rain Frog	LC
Brevicipitidae	<i>Breviceps mossambicus</i>	Mozambique Rain Frog	LC
Brevicipitidae	<i>Breviceps verrucosus</i>	Plaintive Rain Frog	LC
Bufonidae	<i>Schismaderma carens</i>	Red Toad	LC
Bufonidae	<i>Sclerophrys gutturalis</i>	Guttural Toad	LC
Bufonidae	<i>Sclerophrys pusilla</i>	Flatbacked Toad	LC
Heleophrynidae	<i>Hadromophryne natalensis</i>	Natal Cascade Frog	LC
Hyperoliidae	<i>Hyperolius marmoratus</i>	Painted Reed Frog	LC
Hyperoliidae	<i>Kassina senegalensis</i>	Bubbling Kassina	LC
Hyperoliidae	<i>Semnodactylus wealii</i>	Rattling Frog	LC
Pipidae	<i>Xenopus laevis</i>	Common Platanna	LC
Ptychadenidae	<i>Ptychadena porosissima</i>	Striped Grass Frog	LC
Pyxicephalidae	<i>Amietia delalandii</i>	Delalande's River Frog	LC
Pyxicephalidae	<i>Cacosternum nanum</i>	Bronze Caco	LC
Pyxicephalidae	<i>Strongylopus fasciatus</i>	Striped Stream Frog	LC
Pyxicephalidae	<i>Strongylopus grayii</i>	Clicking Stream Frog	LC
Pyxicephalidae	<i>Tomopterna natalensis</i>	Natal Sand Frog	LC

7.1.3 National Wetlands Map 5

The 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. Mapping the locality of wetlands is essential so that

Makhonya Minerals and Resources - Blesbokfontein Portion 2

they may be classified into the different wetland ecosystem types across the country, which in turn can be used along with other data to identify wetlands of conservation significance. The wetland areas identified were predominantly CVB (Channelled Valley Bottom), DEPR (Depression) and SEEP (Seepage) wetlands. The identified wetland areas of the NWP5 within the project area are presented in Figure 7-2.

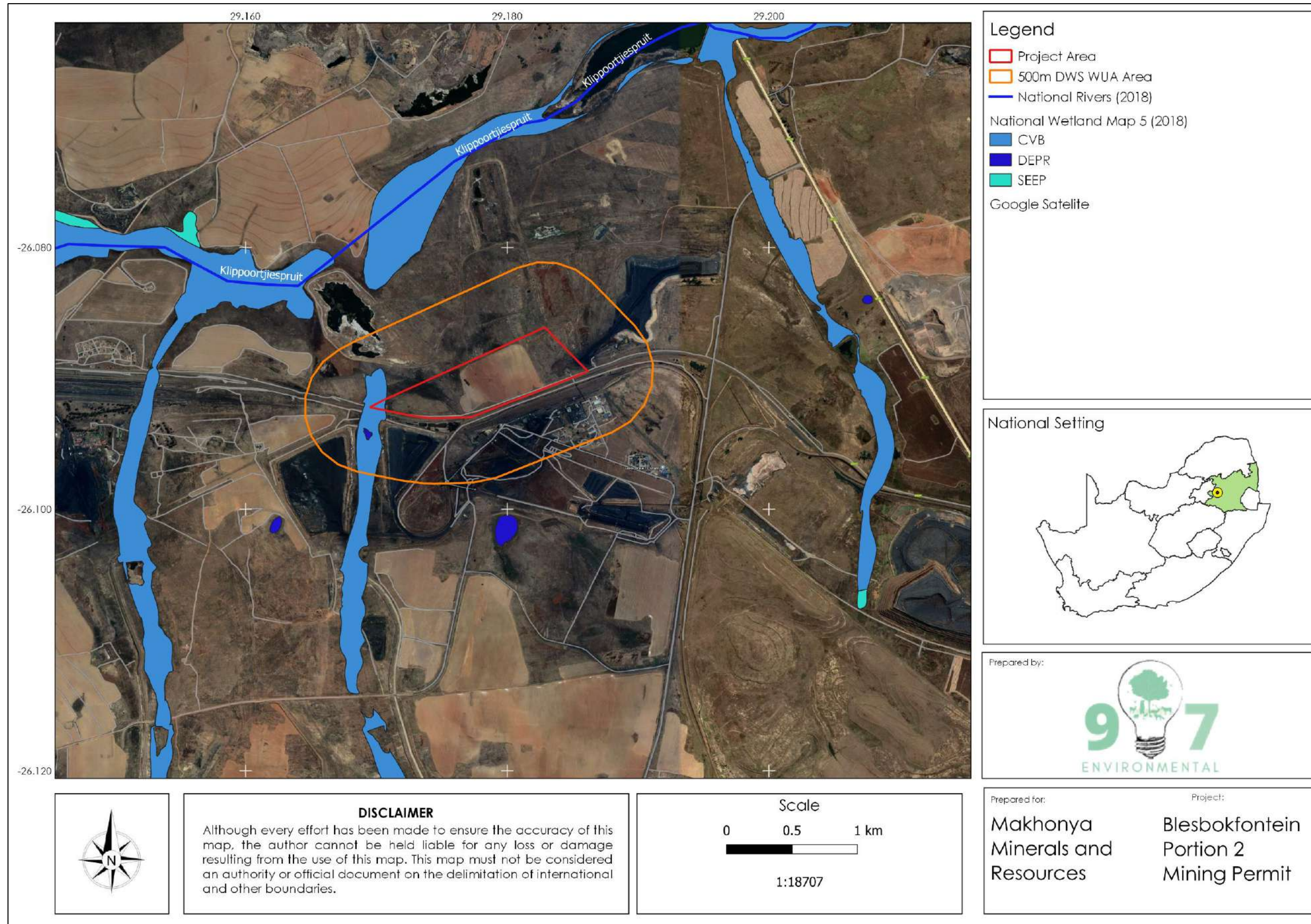


Figure 7-2: The NFEPA Wetlands associated with the project area

7.1.4 Mpumalanga Highveld Wetlands

The purpose of the Mpumalanga Highveld Wetlands 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 in their planning and decision-making processes'' (SANBI, 2012).

The Mpumalanga Highveld Wetlands data also classifies NFEPA land cover based on the defined condition of each area. These are known as the NFEPA wetland conditions categories

Several wetlands (Figure 7-3) were identified within the 500m regulated area for the project. The wetlands are classified as channelled valley bottom and seep wetlands. The wetland condition for the wetlands was determined to be class C (Moderately Modified) or class D (Largely Modified).

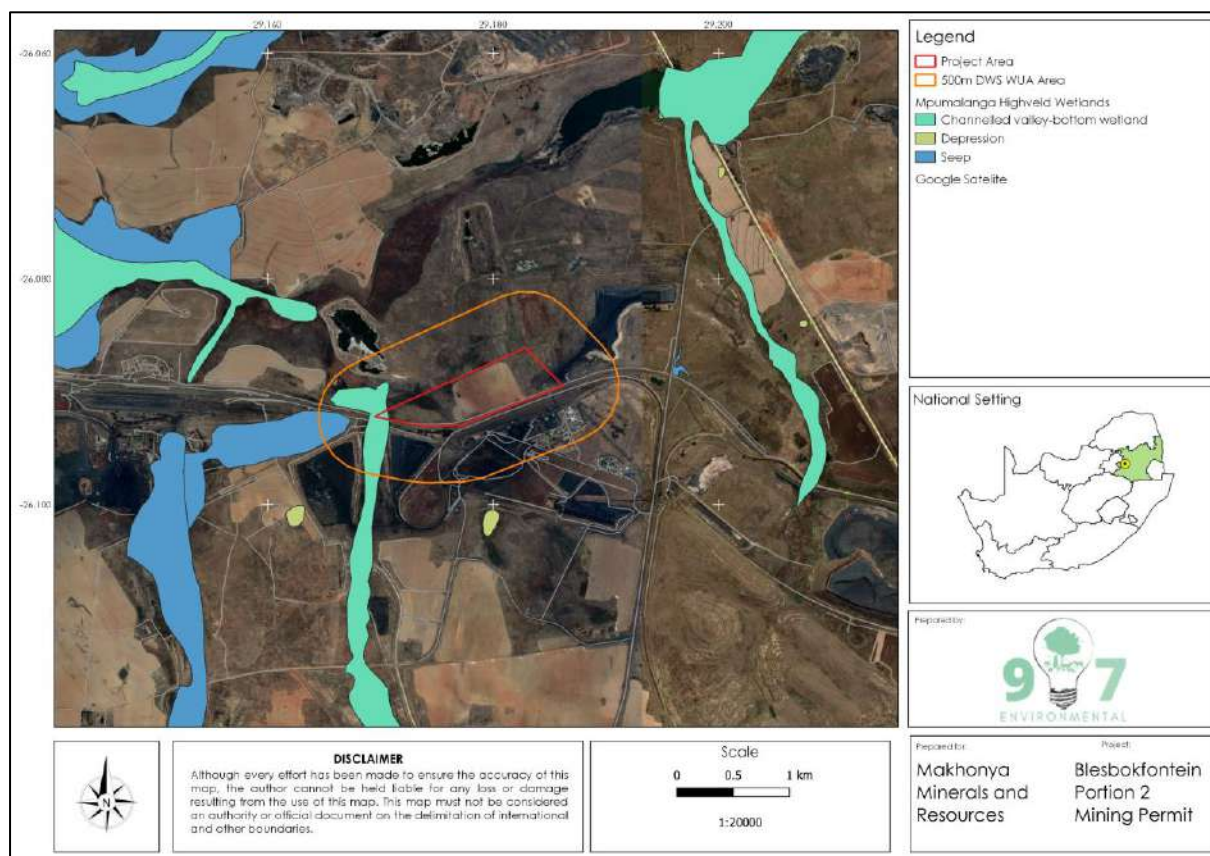


Figure 7-3: The Mpumalanga Highveld wetlands associated with the project area

7.1.5 Ecosystem Status

The remaining natural ecosystems within the project area, were considered as Vulnerable (VU) as seen in Figure 7-4. The state of the ecosystems indicated that these ecosystems are in a threatened state and are being lost at an increased risk of transformation. Furthermore, the protection of the ecosystems within the project area is poorly protected (Figure 7-5).

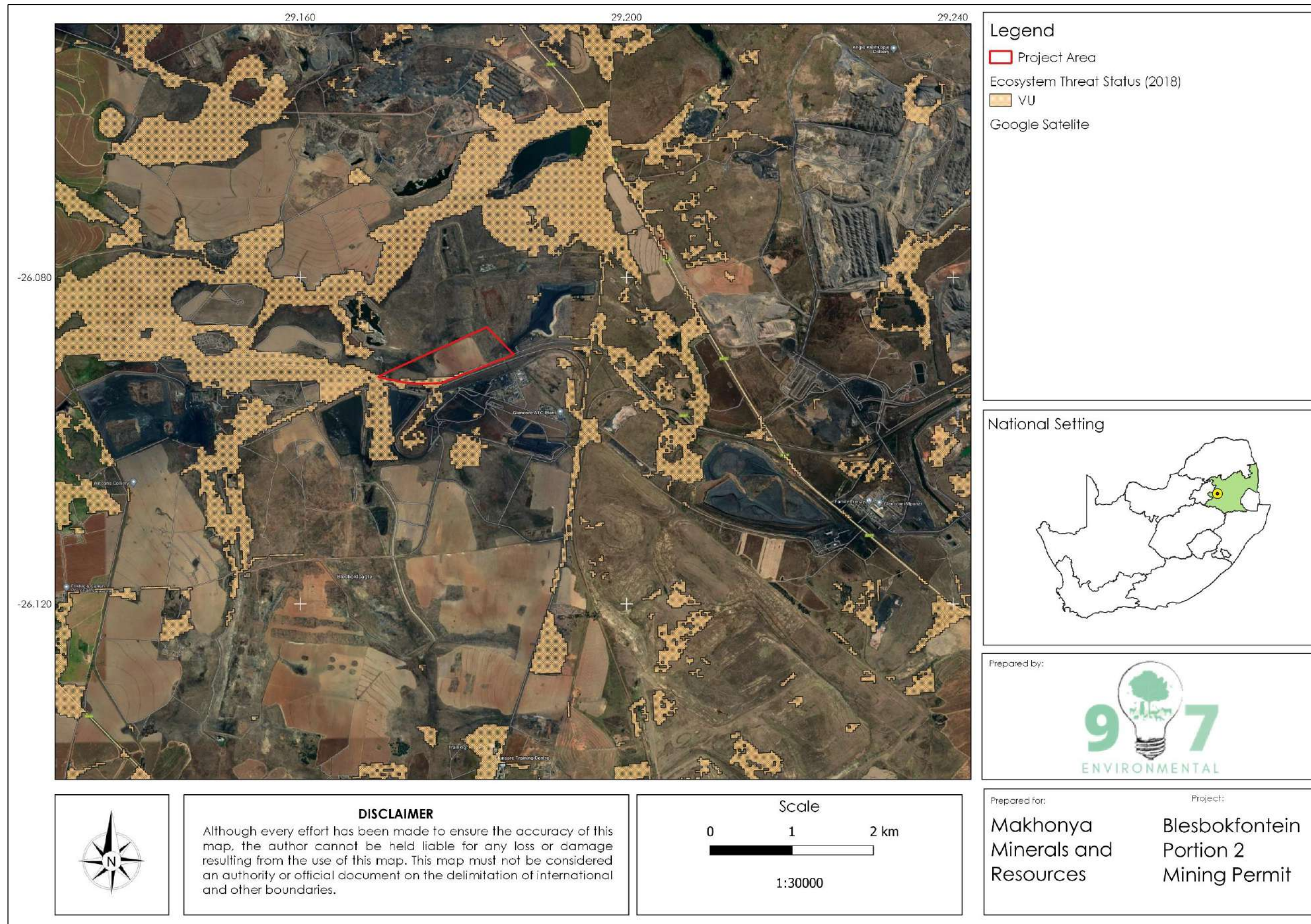


Figure 7-4: Threat status of ecosystems within the project area

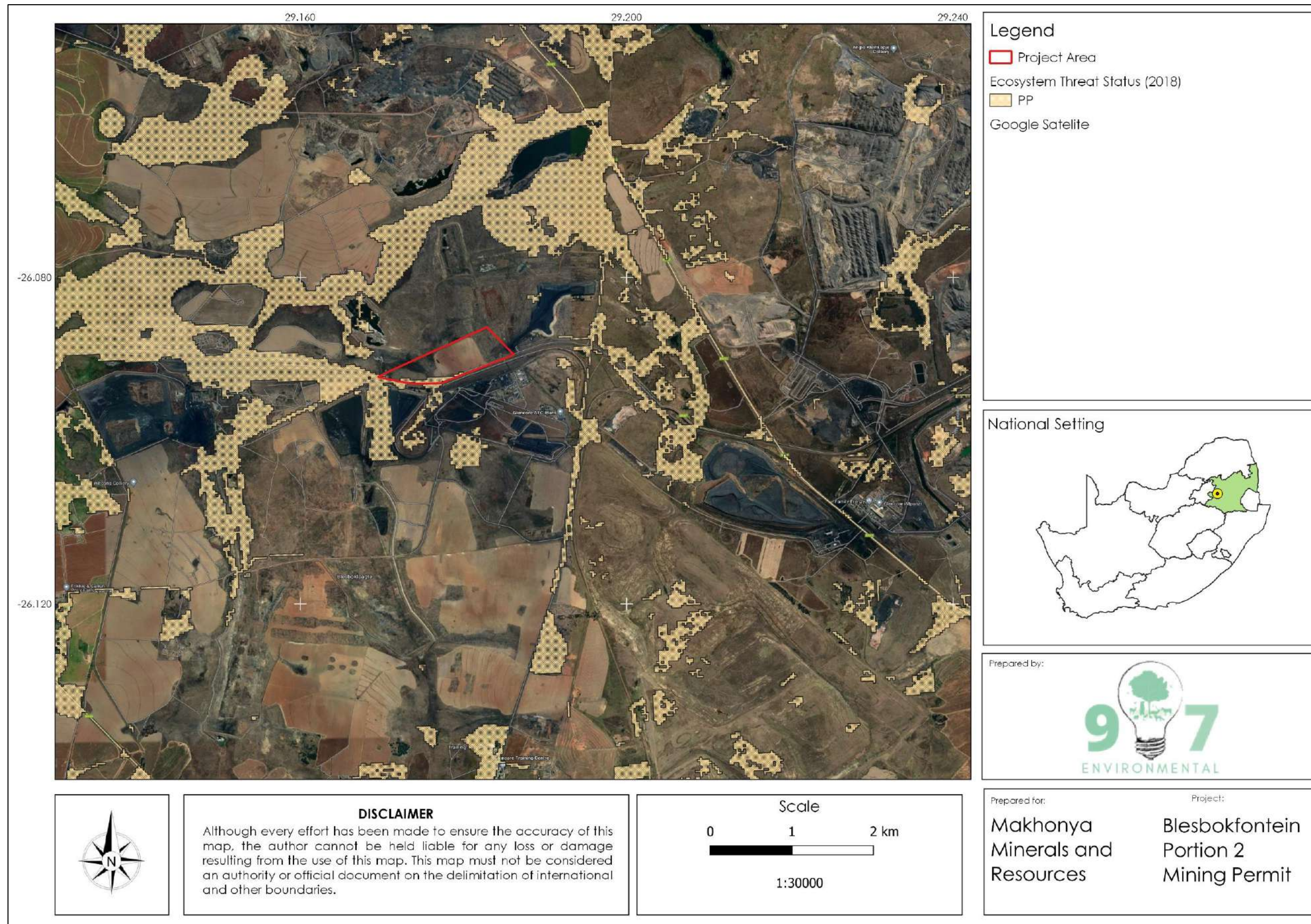


Figure 7-5: Protection status of ecosystems within the project area

7.1.6 Important Bird Areas

The project area was determined to be at least over 20km away from any Important Bird Area.

7.1.7 Protected Areas

Protected areas are areas of conservation importance and are gazetted as proclaimed nature reserves. These areas are protected as they provide safe areas of fauna and flora species. The project area was determined to be over 20km away from any protected area.

7.1.8 Mpumalanga Biodiversity Sector Plan (2014)

The Mpumalanga Biodiversity Sector Plan identifies areas of ecological importance within the Mpumalanga Province. There were no Critical Biodiversity Area identified within the proposed area, only adjacent to the project area, which indicates that there are no potentially sensitive habitats within the project area. Other natural areas, as classified by the MBSP, were identified within the project area as presented in Figure 7-6. The majority of the project area was classified as heavily or moderately modified areas.

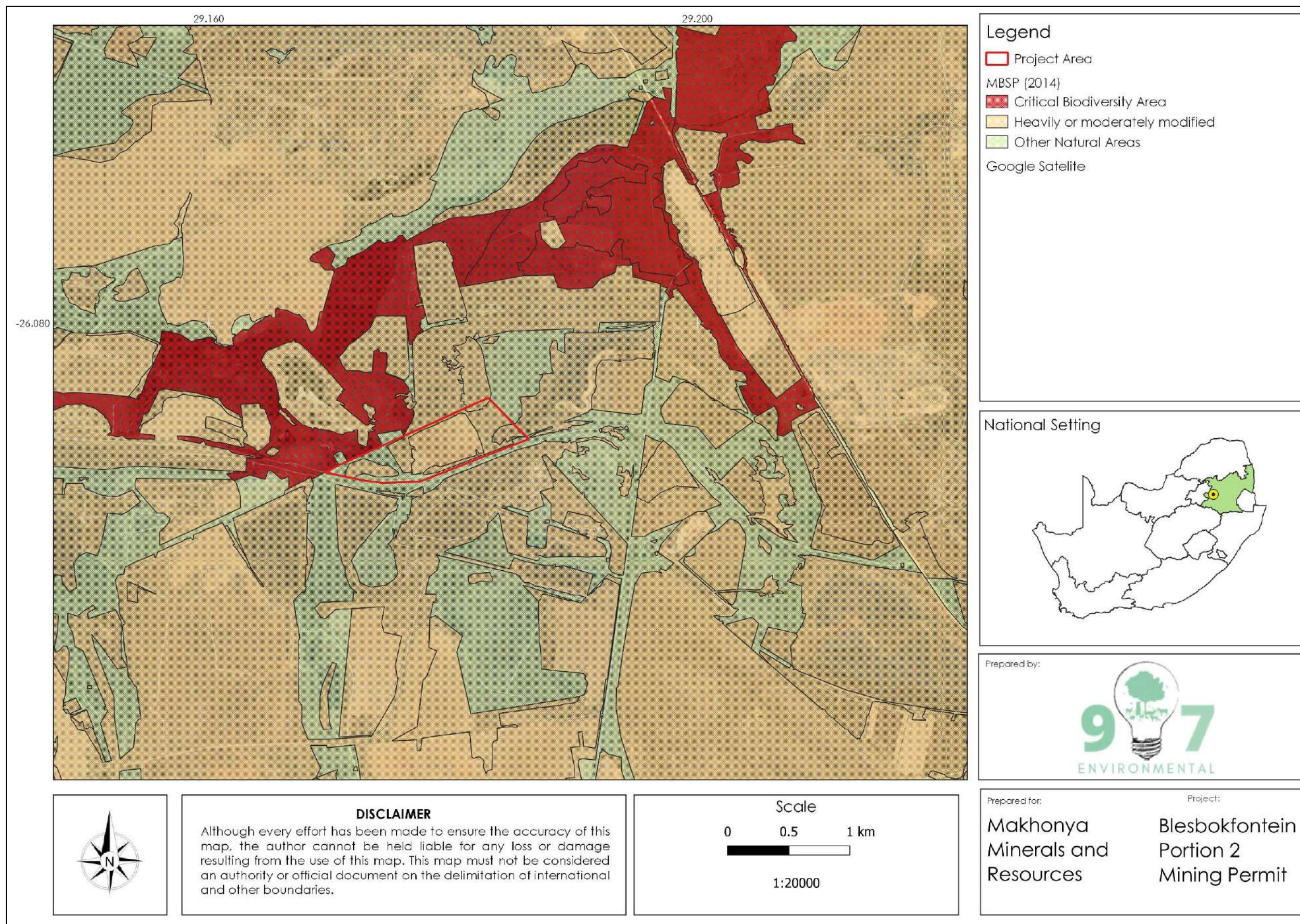


Figure 7-6: The Mpumalanga Biodiversity Sector Plan areas within the project area

7.1.9 Land Uses

The land uses identified within the project area are predominantly cultivated lands (Figure 7-7) which indicates that there is large scale agricultural activity within the project area and surrounding areas. The second largest land use was old land areas followed by mining or mining related activities. It is anticipated that much of the project area has been transformed to cultivated lands based on latest available imagery.

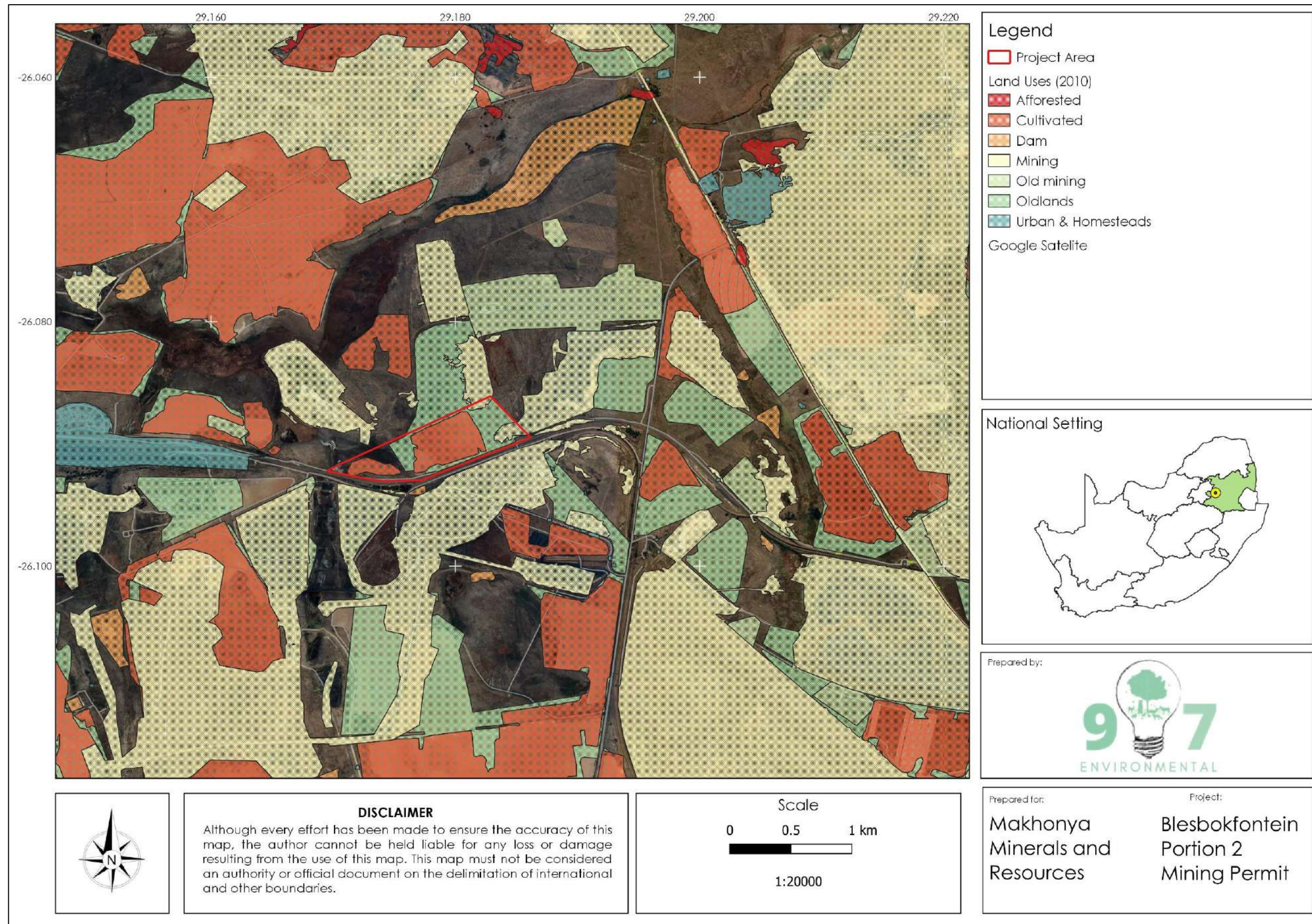


Figure 7-7: Land uses identified within the project area

8 Impact Assessment

8.1 Potential Impacts

Impacts of the proposed project will predominantly impact on the vegetation and water resources within the project area. Potential impacts are listed below; it must be noted that these are potential impacts based on general activities.

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the study area. The relevant impacts were then subjected to a prescribed impact assessment methodology which is described below.

Impacts were assessed in terms of the construction and operational phases. The operational phase includes the maintenance of the transformers. It is assumed that the proposed project will not have a decommissioning phase.

Mitigation measures were only applied to impacts deemed relevant based on the impact analysis. The likelihood and consequence descriptors are presented in Table 8-1 and Table 8-2. The significance rating matrix is presented in Table 8-3.

Table 8-1: Likelihood descriptors

Probability of impact	Rating
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	Rating
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

Table 8-2: Consequence Descriptors

Severity of impact	Rating
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4

Makhonya Minerals and Resources - Blesbokfontein Portion 2

Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	Rating
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	2
Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear features affected > 3000m	5
Duration of impact	Rating
One day to one month: Temporary	1
One month to one year: Short Term	2
One year to five years: Medium Term	3
Life of operation or less than 20 years: Long Term	4
Permanent	5

Table 8-3: Significance Rating Matrix

	CONSEQUENCE (Severity + Spatial Scope + Duration)														
	0	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LIKELIHOOD (Frequency of activity + Frequency of impact)	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

8.2 Identification of Impacts

Impacts of the proposed project will predominantly impact on the vegetation water resources within the project area. Potential impacts are listed in ; it must be noted that these are potential impacts based on a desktop assessment and general activities

Table 8-4: Impacts identified for the proposed project

	Impact	Impact Causing Aspect
Construction Phase	Disturbance/Loss of Vegetation and protected plant	Removal of vegetation
		Stripping and stockpiling of top soil
		Compaction project area
		Drilling activities
		Site access
	Loss of Habitat	Removal of vegetation
		Drilling activities
		Establishment of working area
		Day to day operations
		Clearing of areas for infrastructure
	Loss/Disturbance of Watercourse	Impeding the flow of water.
		Loss of wetland (excavation)
		Erosion of watercourse.
		Sedimentation of the watercourse
		Draining of wetland areas
Operational Phase	Disturbance/Loss of Vegetation	Additional Associated Infrastructure
		Operation of equipment and machinery
		Vehicle activity
		Domestic and industrial waste
		Storage of chemicals, mixes and fuel
		Spills and leaks
	Habitat Fragmentation	Operation of machinery/Noise
		Human activity
		Traffic / vehicle activity
	Loss/Disturbance of Watercourse	Impeding the flow of water.
		Contamination of watercourse
		Erosion of watercourse.
		Sedimentation of the watercourse
		Drainage of wetland areas
		Domestic and industrial waste
		Storage of chemicals, mixes and fuel
		Spills and leaks

8.2.1 Potential Impacts to Vegetation Communities

The following potential impacts were considered on terrestrial vegetation communities:

- ❖ Loss destruction and/or eradication of plant species of conservation concern/ importance; and

8.2.2 Potential Impacts to Faunal Communities

The following potential impacts on faunal communities were considered in this assessment:

- ❖ Loss and/or displacement of faunal species of conservation concern; and
- ❖ Loss of diversity of indigenous faunal communities.

8.2.3 Potential Impacts to Wetlands

The following potential impacts on faunal communities were considered in this assessment:

- ❖ Loss and/or disturbance of wetland area;
- ❖ Loss of wetland plants, and
- ❖ Loss of aquatic habitat.

8.3 Assessment of Significance

8.3.1 Significance of Impacts on Vegetation Communities

Table 8-5 shows the significance of potential impacts associated with the proposed developments on vegetation communities. Prior to implementation of mitigation measures the significance of the impact was rated as moderately high (Table 8-5). This is attributed to the largely natural state of the vegetation within the project area. Although the vegetation has been altered, the project area falls within endangered and vulnerable vegetation units and as such poses a moderately high impact.

8.3.2 Significance of Impacts on Faunal Communities

The significance assessment of potential impacts associated with the development on the faunal communities is presented in Table 8-6. Prior to implementation of mitigation measures both impacts were rated as moderate (Table 8-6). This was attributed to the degree of disturbance observed on the site and the low likelihood of species of conservation concern occurring on the site.

8.3.3 Significance of Impacts on Wetlands

The significance assessment of potential impacts associated with the development on the wetlands is presented in Table 8-7. Prior to implementation of mitigation measures the impacts were rated as high. The wetland areas included the potential unchannelled valley bottom wetland. The proposed project would impact directly on the wetland areas.

According to the buffer guideline (Macfarlane, et al. 2015) a high-risk activity would require a buffer that is 95% effective to reduce the risk of the impact to a low-level threat. The risk assessment assumes that the buffer zone will be marked a no-go zone and all working will be beyond this buffer zone

Table 8-5: Assessment of significance of potential impacts on vegetation communities associated with the proposed project

Impact	Prior to mitigation							
	Duration of Impact	Spatial Scope	Sensitivity of Receiving Environment	Severity of Impact	Probability of Impact	Consequence	Likelihood	Significance
Loss destruction and/or eradication of plant species of conservation concern/ importance	5	3	2	4	4	10	8	80
	Permanent	Local area	Ecology with limited sensitivity/importance	Small	Possible			Moderately High

Table 8-6: Assessment of significance of potential impacts on faunal communities associated with the proposed project

Impact	Prior to mitigation							
	Duration of Impact	Spatial Scope	Sensitivity of Receiving Environment	Severity of Impact	Probability of Impact	Consequence	Likelihood	Significance
Loss and/or displacement of faunal species of conservation concern	5	3	2	3	4	10	7	70
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			Moderate
Loss of diversity of indigenous faunal communities	5	3	2	3	4	10	7	70
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			Moderate

Table 8-7: Assessment of significance of potential impacts on wetlands associated with the proposed project

Impact	Prior to mitigation							
	Duration of Impact	Spatial Scope	Sensitivity of Receiving Environment	Severity of Impact	Probability of Impact	Consequence	Likelihood	Significance
Loss and/or disturbance of wetland/watercourse areas	5	3	5	4	4	13	8	117
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			High
Loss of wetland plant species	5	3	5	5	4	13	9	117
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			High
Loss of aquatic habitat	5	3	5	5	4	13	9	117
	Permanent	Local area	Ecology with limited sensitivity	Small	Possible			High

Makhonya Minerals and Resources - Blesbokfontein Portion 2

The impacts identified for the proposed project were related to the habitats, vegetation units and watercourses in the project area. It is expected that impacts to terrestrial fauna will be moderate as animals are able to migrate and with the current forestry practices, faunal activity is expected to be limited. The impacts to the vegetation are expected to be moderately high as the project proposes to mine and/or develop on the whole project area. The impacts to the watercourses are expected to be high as a result of the loss of wetland areas, loss of wetland biodiversity, contamination of water sources and the loss of downstream aquatic habitat.

The impacts were not determined after mitigation as there was not a development plan or activities list made available. The impacts remain moderate to high for the proposed prospecting development.

8.4 Water Resources Buffer Requirement

The Buffer Zone Tool was utilised to calculate a desktop buffer zone for the watercourse in the project area. The NFEPA wetlands and NFEPA Rivers were considered as wetland areas for the desktop buffer determination. Table 8-8 presents the risk associated with the proposed prospecting and the recommended desktop buffer zone to protect watercourse areas.

Table 8-8: Buffer zone determination

Threat Posed by the proposed land use / activity		Desktop Threat Rating
Construction Phase	1. Alteration to flow volumes	N/A
	2. Alteration of patterns of flows (increased flood peaks)	VL
	3. Increase in sediment inputs & turbidity	H
	4. Increased nutrient inputs	N/A
	5. Inputs of toxic organic contaminants	N/A
	6. Inputs of toxic heavy metal contaminants	L
	7. Alteration of acidity (pH)	N/A
	8. Increased inputs of salts (salinization)	N/A
	9. Change (elevation) of water temperature	VL
	10. Pathogen inputs (i.e. disease-causing organisms)	VL
Operational Phase	1. Alteration to flow volumes	L
	2. Alteration of patterns of flows (increased flood peaks)	L
	3. Increase in sediment inputs & turbidity	L
	4. Increased nutrient inputs	L
	5. Inputs of toxic organic contaminants	L
	6. Inputs of toxic heavy metal contaminants	M
	7. Alteration of acidity (pH)	L
	8. Increased inputs of salts (salinization)	L
	9. Change (elevation) of water temperature	L
	10. Pathogen inputs (i.e. disease-causing organisms)	VL
Desktop buffer requirement (m)		80

8.5 Recommendations

Taking into consideration the limitations of the project, the following recommendations are provided:

- ❖ A 150m buffer zone must be applied to all watercourse areas and must be considered a no-go zone. The Buffer Tool recommends an 80m buffer zone; however, this buffer is based on a desktop delineation and as such may not cater for the slopes, land cover and landuses;
- ❖ A full ecological survey must be conducted during the EIA phase of the project; and
- ❖ The impact assessment must make use of ecological data to make informed decisions and infrastructure planning.

8.6 Mitigation Measures

The following are mitigation measures to be applied before commencement of the project:

- ❖ The water resources within the project site area must be avoided where possible;
- ❖ The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access;
- ❖ Laydown yards, camps and storage areas must be beyond the water resources and buffer zones. Where possible, the construction of the road and crossings must take place from the existing road and not from within the watercourse;
- ❖ The contractors used for the project should have action plans on site, spill kits and training to ensure that any fuel or oil spills are clean-up and discarded correctly;
- ❖ It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces;
- ❖ Prevent uncontrolled access of vehicles through the watercourses that can cause a significant adverse impact on the hydrology and soil structure of these areas;
- ❖ All chemicals and toxicants to be used for the road construction must be stored outside the water resources and in a bunded area;
- ❖ All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- ❖ All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping";
- ❖ Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);

- ❖ All removed soil and material must not be stockpiled within the system. Stockpiling should take place outside of the watercourse. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;
- ❖ Erosion and sedimentation into the channel must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed banks;
- ❖ Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- ❖ No dumping of construction material on-site may take place; and
- ❖ All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.

9 Opinion of the Specialist

An impact statement is required as per the NEMA regulations with regards to the proposed development.

It is the opinion of the specialist that the proposed project be authorised provided that all mitigation measures are implemented, and the following conditions be included in the environmental authorisation for this project:

9.1 Conditions for Environmental Authorisation

- ❖ Any water resource areas and 80m buffer zones must be avoided for the duration of the project and all the proposed activities and secondary activities must be outside the wetland and buffer zones;
- ❖ An Environmental Control Officer (ECO) must be appointed and be present for the duration of prospecting period; and
- ❖ A rehabilitation plan must be compiled and implemented for the for all phases of the project. The rehabilitation plan must make provision for the rehabilitation and/or remediation of wetland areas and include an action plan (emergencies) for environmental hazards.

10 Conclusion

The majority of the project area is considered as modified with small pocket of natural areas. The ecosystems within the project area, were considered as Vulnerable and poorly protected which indicates that these ecosystems are at risk of increased transformation.

The impacts identified for the proposed project were related to the habitats, vegetation units and watercourses in the project area. It is expected that impacts to terrestrial fauna will be moderate as animals are able to migrate and with the current forestry practices, faunal activity is expected to be limited. The impacts to the vegetation are expected to be moderately high as the project proposes to mine and/or develop on the whole project area. The impacts to the watercourses are

Makhonya Minerals and Resources - Blesbokfontein Portion 2

expected to be high as a result of the loss of wetland areas, loss of wetland biodiversity, contamination of water sources and the loss of downstream aquatic habitat.

The impacts were not determined after mitigation as there was not a development plan or activities list made available. The impacts remain moderate to high for the proposed prospecting development.

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