PROSPECTING RIGHT APPLICATION, MAGISTERIAL DISTRICT OF BONJANALA, NORTH WEST PROVINCE

ECOLOGICAL IMPACT ASSESSMENT

DEA Reference:

Prepared for:

K2015268783 (South Africa)
(Pty) Ltd

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REVISIONS TRACKING TABLE

EOH Coastal and Environmental Services

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Name	Responsibility	Signature	Date
Caryn Clarke	Author		17 October 2018

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1 THE PROJECT TEAM

1.1 Details of specialist

Ms Caryn Clarke M.Sc., *Cand. Nat. Sci.*
(Ecologist)

Caryn holds a M.Sc. Environmental Science (2012) from Rhodes University. Her M.Sc. thesis was titled "Responses to the linked stressors of Climate Change and HIV/AIDS amongst vulnerable rural households in the Eastern Cape, South Africa". Her B.Sc. Hon. thesis investigated climate change perceptions, drought responses and views on carbon farming amongst commercial livestock and game farmers within the Great Fish River Valley, Eastern Cape. Caryn is a registered Candidate Natural Scientist under the South African Council for Natural Scientific Professions (SACNASP).

Dr Alan Carter *Pri. Nat Sci.*
(*Report reviewer*)

As Director of the East London Office Alan has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute. Alan is registered with both the South African Council for Natural Scientific Professional (SACNASP).

1.2 Expertise

Relevant projects EOH CES have worked on include:

Name of project	Description of responsibility	Date completed
Department of Rural Development and Agrarian Reform Lambasi Feedlot	Ecological Impact Assessment	September 2016
Element Debe Water Supply Scheme Phase 2 EIA (EC)	Ecological Impact Assessment	March 2016
BCMM Haven Hills Cemetery EIA (EC)	Ecological Impact Assessment	March 2016
InnoWind Riverbank Wind Energy Facility Ground truthing and permitting (EC)	Wetland Impact Assessment	February 2016
Mbhashe Local Municipality Road Upgrade (EC)	Ecological Impact Assessment and Wetland Impact Assessment	June 2015
GIBB SANRAL N2 Green River to Zwelitsha Road Upgrade (EC)	Ecological Impact Assessment	November 2015
GIBB SANRAL N2 Bypass (EC)	Ecological Impact Assessment	February 2016
Expansion of the Mkhambathi Forest Plantation (EC)	Aquatic Impact Assessment	April 2016
Amathole Water Pipeline from Sandile WTW to	Ecological Impact Assessment	October 2017

1.3 Declaration

- I, Caryn Clarke, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998; NEMA), as amended and the Environmental Impact Assessment Regulations, 2014;
- 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 report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

2 INTRODUCTION

2.1 Project description and location

EOH Coastal & Environmental Services (CES) has been appointed by K2015268783 (South Africa) (Pty) Ltd., to undertake the required environmental services, in the form of a Basic Assessment process for a prospecting right for mineral commodities such as copper, lead, zinc, nickel and cobalt (Base Metals) and gold and silver (Precious Metals) on the following properties 68 km southwest from the town of Thabazimbi within Magisterial District of Bojanala, North West Province (Figure 2.1 below):

- The Farm De Paarl 246 KP;
- The Farm Goedgedacht 255 KP;
- The Farm Bedford 254 KP; and
- The Farm Syferbult 257 KP.

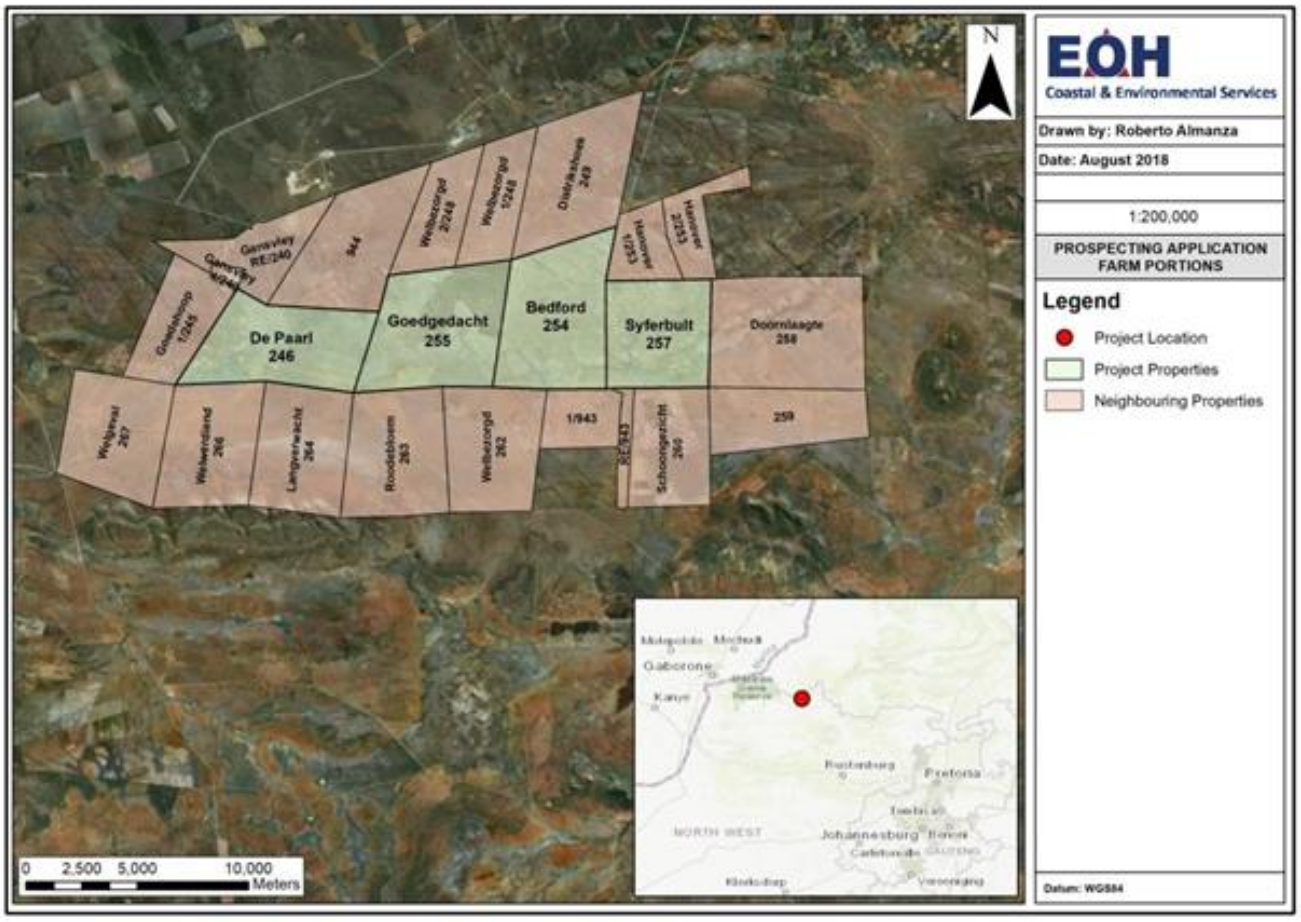

Figure 2.1: Locality Map

EOH Coastal and Environmental Services (EOH CES) was commissioned to assess ecological environment affected by the proposed prospecting application. This report provides input into the Basic Assessment (BA) process.

2.2 Prospecting Activities

The proponent intends to prospect mineral commodities such as Copper, Lead, Zinc, Nickel (Ni) and Cobalt (Co) (Base metals) and, Gold and Silver (Precious metals), over four (4) portions of land approximately 10,036 hectares in extent.

The project will entail a one (1) year non-invasive geophysical survey period (Phase 1) and a four (4) year invasive drilling period (Phase 2 & 3). Phase 2 (24 months) will consist of approximately 20 drill holes approximately 200 m deep, soil geochemical survey (approximately 5,000 samples) and trenching (approximately 4,000 m). Phase 3 (24 months) will consist of approximately 50 drill holes 200 m deep.

For drilling, Reverse Circulation and Diamond Core drilling methods will be used. Drilling rigs are mounted on a 4 x 4 truck or trailer. The hole diameter for Reverse Circulation holes is typically 80-123 mm and for diamond core 50-80 mm. The mineralisation is present from surface and will be targeted up to a depth of approximately 200 m. Drill hole sites will be GPS located and pegged. Drill sites are inspected and photographed prior to any disturbance.

After each drill hole is complete, logged and sampled, the borehole collar will be surveyed by an independent surveyor using a high-accuracy differential GPS. Thereafter the drill sumps will be filled in, the drill area rehabilitated and photographed according to the procedures as stipulated in the Environmental Management Plan.

The boreholes will be logged and mineralised horizons sampled by qualified geologists. Samples will be submitted for analyses to determine the metal content. Each sample will be logged, halved, bagged and numbered at a central core yard by the geologist and field assistants. The bagged samples will then be dispatched to the contracted laboratory. The remaining core and other half sample will be stored for future test work. Analysis to determine the metal content (gold, silver, copper, lead, zinc and nickel) is conducted off site at an accredited independent Laboratory.

In terms of trenching, an excavator or similar equipment will be used at regular intervals and perpendicular to geophysical and geochemical anomalies. Trenches will typically be 1 m wide and from a few centimeters deep (where hard rock is near the surface) to 0.5 m deep. The edges of the trenches will be geologically mapped and channel samples collected for laboratory analysis. Trenches will be GPS located and pegged. Rehabilitation of the trenches will be undertaken as soon as practical following surface disturbance. The soil and rock is returned to the hole before the topsoil is replaced. The surface is left slightly mounded to allow for subsidence. Trenches will be inspected and photographed prior to and after excavation.

Soil samples are collected on a rectangular pattern, generally with closer spacing of sample sites (20-100 m apart) along more widely spaced sample lines (200 m to 500 m apart). The sampling lines are oriented normal, or at a high angle, to the expected longer dimension of the target. Samples are obtained by digging a small hole with a long-handled pick, usually down to the “B” horizon, typically between 20 cm and 30 cm below surface. A 300-500 g sample is collected and placed in chemical-free paper (geochemical) bags suitable for air drying or drying in an oven. The sample hole is back-filled immediately after collection of the sample. Samples are submitted to an off-site laboratory for preparation (incl. sieving) and analyses.

It should be noted that no new access roads will be required. A camp site of approximately 100 m x 100 m (10,000 m^2) will be established at a suitable location on site.

2.3 Alternatives

No site alternatives were assessed. However, based on the findings on site, recommendations for alternative drill sites may be recommended.

2.4 Objectives and Terms of Reference

The main objective of this report is to determine the status quo of the affected ecological environment as well as the potential impact that the proposed development and associated infrastructure may have on the vegetation, faunal, and aquatic habitats.

The following terms of reference were used for the objectives of this study:

- Describe the study area in terms of land cover and vegetation, likely fauna and habitat. This aspect of the report will specifically include the identification of -
    - Areas of high biodiversity;
    - The presence of Species of Conservation Concern (SCC) , including sensitive, endemic and protected species;
    - The presence of areas sensitive to invasion by alien species; and
    - The presence of conservation areas and sensitive habitats where disturbance should be avoided or minimised;
- Review relevant legislation, policies, guidelines and standards;
- Assess the potential direct and indirect impacts resulting from the proposed development both on the footprint and the immediate surrounding area during prospecting;
- Provide a detailed description of appropriate mitigation measures that can be adopted to reduce negative impacts of prospecting, where required;
- Review checklists of plant and animal groups identified in the region to date, highlighting sensitive species and the likely areas of distribution; and
- Identify the need for permitting.

2.5 Assumptions and Limitations

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit:

- Even though the area was sampled, sampling is random and thus it is possible that additional SCCs could be found during prospecting (construction phase) of the proposed development. Permitting will be required should additional SCC be found on site.
- Sampling could only be conducted once-off. Consequently, seasonal changes that may occur in the vegetation type were not observed and some plant species may have gone undetected. However, the data collected is sufficient for the purposes of this project.
- Ecological descriptions of the natural environment are based on limited fieldwork and available literature.
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the accompanying maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

3 APPROACH & METHODOLOGY

In terms of Appendix 6 of the EIA Regulations (as amended in 2017) a specialist report must contain:

(cA) An indication of the quality and age of the base data used for the specialist report;
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;
(e) A description of the methodology adopted in preparing the report or carrying out the specialised process;

The study site and surrounding areas were assessed using a two-phased approach, namely a desktop assessment and a physical site assessment:

3.1 Desktop Assessment

Firstly, a desktop assessment of the study area was conducted in terms of current vegetation classifications, biodiversity programmes and plans. This included the consideration of:

- SANBI vegetation (Mucina & Rutherford, 2006);
- North West Biodiversity Management Act (Act No. 4 of 2016);
- North West Biodiversity Sector Plan (2015);
- The National Freshwater Ecosystem Priority Areas (NFEPA);
- National Protected Areas Act (NO. 57 of 2003; NEMPAA);
- National Protected Areas Expansion Strategy (NPAES);
- Review of the SANBI Red Data List;
- Convention on International Trade in Endangered Species (CITES);
- International Union for Conservation of Nature (IUCN);
- National Biodiversity Management: Biodiversity Act (NEMBA) List of Threatened or Protected Species;
- National Biodiversity Management: Biodiversity Act (NEMBA) List of Alien Invasive Vegetation; and
- Department of Agriculture, Forestry and Fisheries (DAFF) List of Protected Trees.

3.2 Site Assessment

A site visit was conducted on 27 September 2018 in order to assess the actual ecological state and current land-use in the area and to identify potential sensitive ecosystems and plant species within the project footprint and surrounds. This season was not chosen for a particular reason but largely based on availability of the specialist and safety team to assess the area. The findings of the site visit also served to inform the impact identification process of the proposed prospecting on the terrestrial and aquatic habitats, and to assist in determining how significant these impacts would be.

The application area is 10 036 hectares in extent, however the development footprint of the prospecting activities will be 1.65 hectares, which will include the proposed drill sites (80 mm x 123 mm and 50 mm x 80 mm in diameter for reverse circulation and diamond core drilling respectively), trenches (1 m wide x few centimeters deep) and soil sampling (20 – 30 cm deep) will

be minimal. Existing access routes on site are proposed to be largely used, and a 100 m x 100 m area for the construction camp will be required.

3.3 Terrestrial habitat

Several of the proposed drill sites were inspected to evaluate the vegetation of the study area and to provide more detailed information on the plant communities present. The site inspection took into account the amount of time available for the study and limitations such as the seasonality of the vegetation.

Areas of high sensitivity as well as SCCs have been identified as far as possible, either from existing records from the study area obtained from a literature review and/or from the site survey. The primary aim of this study was to identify whether areas of high sensitivity will be subject to significant impacts from the proposed activity. Aspects that would increase impact significance include:

- Presence of plant SCCs;
- Vegetation types of conservation concern;
- Areas of high biodiversity;
- The presence of important process areas such as:
  - Ecological corridors;
  - Water bodies (including wetlands & rivers); and
  - Topographical features (especially steep and rocky slopes that provide niche habitats for both plants and animals).

It is not the aim of this study to produce a complete list of all plant species occurring in the region, but rather to examine a representative sample. It is however, important to note that areas of high sensitivity as well as SCC have been identified as far as possible, either from records from the site or a review of their habitat requirements, and whether or not these habitats occur within the site.

3.4 Aquatic Habitats

The National Freshwater Ecosystem Priority Areas (NFEPA, 2011-2014) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas, or FEPAs. The system comprises a hierarchical classification process of defining a wetland based on the principles of the hydro-geomorphic (HGM) approach at higher levels, with structural features being included at the finer levels (SANBI, 2009). Wetland ecosystem types were used by the NFEPA project for representing natural examples of the diversity of wetland ecosystem types across South Africa. Wetlands of the same ecosystem type are expected to share similar functionality and ecological characteristics. The biodiversity conservation target for freshwater ecosystems in South Africa is 20%, which means that we should keep at least 20% of each wetland ecosystem type in a natural or near-natural condition. This serves to conserve many common species and communities, and the habitats in which they evolve. Information used to classify wetlands as FEPAs included:

- Ramsar status;
- Known threatened frog and water-bird occurrences; and
- Expert knowledge on biodiversity importance.

For the purposes of this study, Version 4 of the National Wetland Classification System (NWCS) was used as baseline information, as per SANBI's BGIS interactive tool.

Important rivers are also classified according to the NFEPA project rivers maps. These rivers are considered FEPAs. FEPAs are an essential part of an equitable and sustainable water resource strategy, meaning that they need to stay in a good condition to manage and conserve freshwater ecosystems, and to protect water resources for human use. This means that the areas should be supported by good planning, decision-making and management to ensure that human use does not impact on the aquatic ecosystem. Wetland FEPAs were selected in this resource document based on significant specialist input that relates to information as diverse as crane breeding areas and protected frog habitats.

The application area was assessed for the presence of NFEPA wetlands and rivers, as well as for the presence of any other waterbody on site.

3.5 Sensitivity assessment

This section of the report explains the approach to determining the ecological sensitivity of the study area on a broad scale. The approach identifies zones of high, moderate and low sensitivity according to a system developed by EOH CES and used in numerous ecological studies. It must be noted that the sensitivity zonings in this study are based solely on ecological characteristics and social and economic factors have not been taken into consideration. The sensitivity analysis described here is based on 10 criteria which are considered to be of importance in determining ecosystem and landscape sensitivity. The method predominantly involves identifying sensitive vegetation or habitat types, topography and land transformation (Table 3.1).

The sensitivity criteria described in Table 3.1 below were applied to the application area. The entire site was then categorised into zones of HIGH, MODERATE or LOW sensitivity. Although very simple, this method of analysis provides a good, yet conservative and precautionary assessment of the ecological sensitivity.

Table 3.1. Criteria used for the analysis of the sensitivity of the area.

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
1	**Topography**	Level or even	Undulating; fairly steep slopes	Complex and uneven with steep slopes
2	**Vegetation** - Extent or habitat type in the region	Extensive	Restricted to a particular region / zone	Restricted to a specific locality / site
3	**Conservation status** of fauna / flora or habitats	Well conserved independent of conservation value	Not well conserved, moderate conservation value	Not conserved - has a high conservation value
4	**Species of special concern** - Presence and number	None, although occasional regional endemics	No endangered or vulnerable species, some indeterminate or rare endemics	One or more endangered and vulnerable species, or more than 2 endemics

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
				or rare species
5	**Habitat fragmentation** leading to loss of viable populations	Extensive areas of preferred habitat present elsewhere in region not susceptible to fragmentation	Reasonably extensive areas of preferred habitat elsewhere and habitat susceptible to fragmentation	Limited areas of this habitat, susceptible to fragmentation
6	**Biodiversity** contribution	Low diversity or species richness	Moderate diversity, and moderately high species richness	High species diversity, complex plant and animal communities
7	**Visual quality** of the site or landscape from other vantage points	Site is hidden or barely visible from any vantage points with the exception in some cases from the sea	Site is visible from some or a few vantage points but is not obtrusive or very conspicuous	Site is visible from many or all angles or vantage points
8	**Erosion potential** or instability of the region	Very stable and an area not subjected to erosion	Some possibility of erosion or change due to episodic events	Large possibility of erosion, change to the site or destruction due to climatic or other factors
9	**Rehabilitation** potential of the area or region	Site is easily rehabilitated	There is some degree of difficulty in rehabilitation of the site	Site is difficult to rehabilitate due to the terrain, type of habitat or species required to reintroduce
10	**Disturbance** due to human habitation or other influences (alien invasive species)	Site is very disturbed or degraded	There is some degree of disturbance of the site	The site is hardly or very slightly impacted upon by human disturbance

3.6 Impact Assessment Methodology

To ensure a direct comparison of impact assessment between various specialist studies, a standard impact rating scale has been developed and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Five factors need to be considered when assessing the significance of impacts, namely:

- Relationship of the impact to **temporal scales** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Relationship of the impact to **spatial scales** - the spatial scale defines the physical extent of the impact.

- The severity of the impact - the **severity/beneficial scale** is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.
- The **severity** of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
- The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
- Each criterion is ranked with scores assigned as presented in the tables below to determine the **overall significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in the tables below, to determine the overall significance of the impact. The overall significance is either negative or positive.

The significance scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of a social nature need to reflect the values of the affected society.

3.6.1 Cumulative Impacts

Cumulative impacts affect the significance ranking of an impact because the impact is taken in consideration of both onsite and offsite sources. For example, pollution making its way into a river from a development may be within acceptable national standards. Activities in the surrounding area may also create pollution which does not exceed these standards. However, if both onsite and offsite activities take place simultaneously, the total pollution level may exceed the standards. For this reason it is important to consider impacts in terms of their cumulative nature.

3.6.2 Seasonality

Although seasonality is not considered in the ranking of the significance, it may influence the evaluation during various times of year. As seasonality will only influence certain impacts, it will only be considered for these, with management measures being imposed accordingly (i.e. presence of SCCs, dust suppression measures being implemented during the dry season).

Table 3.2. Significance Rating Table.

Temporal Scale (The duration of the impact)	
Short term	Less than 5 years (many construction phase impacts are of a short duration).

Medium term	Between 5 and 20 years.
Long term	Between 20 and 40 years (from a human perspective almost permanent).
Permanent	Over 40 years or resulting in a permanent and lasting change that will always be there.
Spatial Scale (The area in which any impact will have an affect)	
Individual	Impacts affect an individual.
Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the study area.
Project Level	Impacts affect the entire study area.
Surrounding Areas	Impacts that affect the area surrounding the development
Municipal	Impacts affect either the Local Municipality, or any towns within them.
Regional	Impacts affect the wider District Municipality or the province as a whole.
National	Impacts affect the entire country.
International/Global	Impacts affect other countries or have a global influence.
Degree of Confidence or Certainty (The confidence with which one has predicted the significance of an impact)	
Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.

Table 3.3 Impact Severity Rating.

Impact severity (The severity of negative impacts or how beneficial positive impacts would be on a particular affected system or affected party)	
Very severe	Very beneficial
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	Beneficial
Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	Moderately beneficial
Medium to long term impacts on the affected system(s) or party(ies), which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time

conservation value.	consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	Slightly beneficial
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 3.4 Overall Significance Rating.

OVERALL SIGNIFICANCE *(THE COMBINATION OF ALL THE ABOVE CRITERIA AS AN OVERALL SIGNIFICANCE)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance. Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
HIGH NEGATIVE	**BENEFICIAL**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
MODERATE NEGATIVE	**SOME BENEFITS**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
LOW NEGATIVE	**FEW BENEFITS**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist	

as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.

Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.

Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.

NO SIGNIFICANCE

There are no primary or secondary effects at all that are important to scientists or the public.

Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.

DON'T KNOW

In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.

Example: The effect of a particular development on people's psychological perspective of the environment.

4 RELEVANT LEGISLATION

In terms of Appendix 6 of the EIA Regulations (as amended in 2017) a specialist report does not legally have to cover a review of the applicable legislation however this has been included to provide the reader with an overview of the legal requirements related to the Ecological environment.

4.1 Environmental Legislation

Table 4.1: Relevant environmental legislation

1. LEGISLATION/POLICY	DESCRIPTION	IMPLICATIONS FOR THE PROPOSED ACTIVITY
The Constitution (Act 108 of 1996)	The Constitution of the Republic of South Africa is the supreme law of the land. As a result, all laws, including those pertaining to this Management Plan, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right: *a) To an environment that is not harmful to their health or well-being; and* *b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:* *i. Prevent pollution and ecological degradation;* *ii. Promote conservation; and* iii. *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	• Obligation to ensure that the proposed activity will not result in pollution and ecological degradation; and • Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development.
National Environmental Management Act (NEMA) (Act 108 of 1998), and its subsequent amendments.	Relevant Sections of the Act: Section 2, 23, 24, 24-1, 28-33 • Application of the NEMA principles (e.g. need to avoid or minimise impacts, use of the precautionary principle, polluter pays principle, etc.) • Application of fair decision-making and conflict management procedures are provided for in NEMA.	• An application for Environmental Authorisation (as triggered by the Amended EIA Regulations) has been submitted to the Competent Authority (i.e. DEA). • In terms of Section 28, every person who causes; has caused, or may cause significant pollution or degradation of the environment

Amended NEMA EIA Regulations (GNR. 982) (2014, and subsequent amendments in April 2017)	• Application of the principles of Integrated Environmental Management and the consideration, investigation and assessment of the potential impact of existing and planned activities on the environment; socio-economic conditions; and the cultural heritage. NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons. In addition NEMA introduced a new framework for environmental impact assessments, the EIA Regulations (2014) which has recently been amended. The Amended EIA Regulations (2017) aim to avoid detrimental environmental impacts through the regulation of specific activities that cannot commence without prior environmental authorisation. Authorisation either requires a Basic Assessment or a Full Scoping and Environmental Impact Assessment, depending on the type of activity. These assessments specify mitigation and management guidelines to minimise negative environmental impacts and optimise positive impacts.	must take reasonable measures to prevent pollution or rectify the damage caused – The undertaking of a specialist study, in this case an Aquatic study in order to identify potential impacts on the aquatic environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. • This report complies with Appendix 6 of the Environmental Impact Assessment Regulations (GNR. 982, as amended in 2017) as regulated by the National Environmental Management Act (Act 107 of 1998 and amended in 2014; NEMA), which cover the requirements of the content of a Specialist Report. • The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. • The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.
National Environmental Management: Biodiversity Act (Act 10 of 2004), and its subsequent	The National Environmental Management: Biodiversity Act (NEM:BA), No. 10 of 2004, aims to assist with the management and conservation of South Africa's biological diversity through the use of legislated planning tools. These planning tools include the declaration of bioregions and the associated bioregional plans as well as other mechanisms for managing	• An invasive species management, control and eradication plan for land/activities under their control should be developed, as part of their environmental plans in accordance with section 11 of NEMA.

amendments. Alien Invasive Species Regulations, 2014.	and conserving biodiversity. The objectives of the Act include inter alia: To provide for: • The management and conservation of biological diversity within the Republic and of the components of such biological diversity; • The use of indigenous biological resources in a suitable manner; • The fair and equitable sharing of benefits arising from bio-prospecting of genetic material derived from indigenous biological resources; and • To give effect to ratified international agreements relating to biodiversity which are binding on the Republic. • To provide for co-operative governance in biodiversity management and conservation; and • To provide for a South African National Biodiversity Institute to assist in achieving the objectives of the Act. In addition to this, Sections 50-62 of the Act provide details relating to the protection of threatened or protected ecosystems and species, while Sections 63-77 of the Act provide details relating to alien and invasive species with the purpose of preventing their introduction and spread, managing, controlling and eradicating of alien and invasive species. The NEM:BA Alien and Invasive Species List (Government Notice 599 of 2014) lists alien and invasive species that are regulated by the NEM:BA Alien and Invasive Species Regulations (Government Notice 98 of 2014).	• Activities may not be carried out in threatened or protected ecosystems without first gaining authorisation for such activities. It should however be noted that no threatened or protected ecosystems as listed in NEM:BA have been identified within the study area and thus this is not considered to be relevant to this project. • No protected species may be removed or damaged without a permit.
National Water Act (Act 36 of 1998) and it subsequent amendments.	The purpose of this Act (Section 2) is to ensure that the Nation's water resources are protected, used, developed, conserved and controlled in ways that take into account, including: (a) Promoting sustainable use of water (b) Protection of aquatic and associated ecosystems and their biological diversity	• Appropriate measures must be taken to prevent the pollution of water courses and other water resources. • Riparian zones must be protected. • Construction within a watercourse, within the Regulated area of a watercourse (100 m) and

	(c) Reducing and preventing pollution and degradation of water resources <u>Protection of Water Resources (Sections 12-20)</u> Provides details of measures intended to ensure the comprehensive protection of all water resources, including the water reserve and water quality. With respect to the establishment of water quality objectives, objectives may relate to (Section 13): • the presence and concentration of particular substances in the water • the characteristics and quality of the water resource and the in-stream and riparian habitat • the characteristics and distribution of aquatic biota • the regulation and prohibition of in-stream and land-based activities which may affect the quantity and quality of the water resources <u>Section 19 deals with Pollution Prevention (Part 4)</u> The person (including a municipality) who owns, controls occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. If such measures are not taken, the catchment management agency concerned, may itself do whatever is necessary to prevent the pollution or remedy its effects and recover all reasonable costs from the persons responsible for the pollution. The 'reasonable measures' which have to be taken may include measures to: • Cease, modify or control any act or process causing the pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants;	within a wetland or within the Regulated area of a wetland (500 m) will require a GA/WUA under section 21 (c) & (i) as set out in the National Water Act's (Act 36 of 1998, as amended), associated General Authorisation Regulations related to Section 21 (c) and (i) (GNR. 905 of 2016) which will be issued by the Department of Water and Sanitation (DWS).

- Eliminate any source of the pollution;
- Remedy the effects of the pollution; and
- Remedy the effect of any disturbance to the bed and banks of a watercourse.

With respect to pollution of rivers, the following definition is relevant when considering the potential impacts of development on water resources. Pollution may be deemed to occur when the following are affected:

- the quality, pattern, timing, water level and assurance of instream flow;
- the water quality, including the physical, chemical and biological characteristics of the water;
- the character and condition of the in-stream and riparian habitat;
- the characteristics, condition and distribution of the aquatic biota.

The Act defines 'instream habitat' as including the physical structure of a watercourse and the associated vegetation in relation to the bed of the watercourse.

<u>Riparian Ecosystems</u>

'Riparian habitat' includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species and physical structure distinct from those of adjacent land areas.

<u>Section 21 deals with the Use of Water</u>

Section 21 (a-k) describes activities defined as a water use under the

	Act. These activities may only be undertaken subject to the application for, and issue of, a water use licence.	
National Forest Act (Act 84 of 1998) and its subsequent amendments.	The NFA provides the legal framework for the protection and sustainable use of South Africa's indigenous forests. Any area that has vegetation which is characterised by a closed and contiguous canopy and under storey plant establishment is defined as a 'forest' and as a result falls under the authority of the Department of Agriculture, Forestry and Fisheries (DAFF): Forestry sector. A clause in Chapter 3, Part 1 covers: <u>Prohibition on destruction of trees in natural forests</u> Section 7 (1) No person may cut, disturb, damage or destroy any indigenous living tree in, or remove or receive any such tree from, a natural forest except in terms of (a) a licence issued under subsection (4) or section 23. <u>Prohibition on destruction of protected trees</u> Section 15 (1) No person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. <u>Effect of setting aside protected areas</u> Section 10 (1) No person may cut, disturb, damage or destroy any forest produce in, or remove or receive any forest produce from, a protected area, except— (a) in terms of the rules made for the proper management of the area in terms of section 11(2)(b); (b) in the course of the management of the protected area by the responsible organ of State or person;	• No forest or trees that form part of a forest or forest association may be damaged or destroyed without a permit. • No protected tree species may be damaged or destroyed without a permit.

	(c) in terms of a right of servitude: (d) in terms of the authority of a licence granted under section 7(4) or 23; (e) in terms of an exemption under section 7(1)(b) or 24(6); or (f) in the case of a protected area on land outside a State forest, with the consent of the registered owner or by reason of another right which allows the person concerned to do so, subject to the prohibition in section 7(1).	
National Veld and Forest Fire Act (Act 101 of 1998), and its subsequent amendments.	The National Veld and Forest Fire Act, No. 101 of 1998 (amended in 2001), aims to prevent and combat forest, veld and mountain fires throughout South Africa. This includes the regulation of the establishment, registration, functioning and duties of Fire Protection Associations (FPAs). FPAs manage all aspects of forest, veld and mountain fire prevention and firefighting.	-
Conservation of Agricultural Resources Act, (Act 43 of 1983).	The control of alien invasive plant species is also controlled by the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA). Regulations 15 and 16 under this Act, which relate to problem plants, were amended in March 2001. The purpose of this Act is to provide for control over the utilization of the natural agricultural resources in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants. This is achieved by: • Ensuring the production potential of land is maintained, • Preventing and combating erosion, • Preventing and combating weakening or destruction of the water sources, and • Protecting vegetation and combating weeds and invader plants. The Act provides a list of declared weeds and invader plants as well as	• It should be noted that the CARA regulations for the legal obligations regarding alien invasive plants in South Africa have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which was promulgated on 1 October 2014. However, CARA has not been repealed and is still included as a reference point to use in terms of the management of AIS where certain species may not be included in the NEM:BA AIS list.

	indicators of bush encroachment.
	
	In terms of weeds and invader plants:
	
	• A land user shall control any category 1 plant that occurs on any land or inland water surface.
	• No person shall, except in or for purposes of a biological control reserve –
	  ○ Establish, plant, maintain, multiply or propagate weeds and invader plants;
	  ○ Import or sell propagating material of category weeds and invader plants; and
	  ○ Acquire propagating material of weeds and invader plants.
	
	Combating of category 1 plants (Section 15A) according to CARA (Act No 43 of 1983)
	
	1) Category 1 plants may not occur on any land or inland water surface other than in biological control reserves.
	2) A land user shall control any category 1 plants that occur on any land or inland water surface in contravention of the provisions of sub-regulation (1) by means of the methods prescribed in regulation 15E.
	3) No person shall, except in or for purposes of a biological control reserve –
	  a. Establish, plant, maintain, multiply or propagate category 1 plants;
	  b. Import or sell propagating material of category 1 plants or any category 1 plants;
	  c. Acquire propagating material of category 1 plants or any category 1 plants.	

	(4) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with the requirements of sub-regulation (1) on such conditions as the executive officer may determine in each case. **Combating of category 2 plants (Section 15B) according to CARA (Act No 43 of 1983)** 1) Category 2 plants may not occur on any land or inland water surface other than a demarcated area or a biological control reserve. a. The executive officer may on application in writing demarcate an area as an area where category 2 plants may occur, be established and be maintained. b. An area in respect of which a water use license for stream flow reduction activities has been issued in terms of section 36 of the National Water Act, 1998 (Act No. 36 of 1998) shall be deemed to be a demarcated area. 2) The executive officer shall demarcate an area for the occurrence, establishment and maintenance of category 2 plants only if: a. The category 2 plants in the area are cultivated under controlled circumstances; b. The land user concerned has been authorised to use water in terms of the National Water Act, 1998 (Act No. 36 of 1998); and c. The category 2 plants or products of category 2 plants in the area are demonstrated to primarily serve a commercial purpose, use as a woodlot, shelter belt, building material, animal fodder, soil stabilisation, medicinal or other beneficial function that the executive officer may approve; and d. All reasonable steps are taken to curtail the spreading of propagating material of the category 2 plants outside the	

	demarcated areas. 3) When an area is demarcated for the occurrence, establishment and maintenance of category 2 plants the executive officer may impose such additional conditions as may reasonably be deemed necessary to keep the category 2 plants in the area in check. 4) No person shall sell propagating material of category 2 plants or any category 2 plants to another person unless such other person is a land user of a demarcated area or of a biological control reserve. 5) No person shall acquire propagating material of category 2 plants or any category 2 plants unless such material or such plants are intended for use in a demarcated area or in a biological control reserve. 6) Propagating material of category 2 plants or category 2 plants shall only be imported or sold in accordance with the provisions of the Plant Improvement Act, 1976 (Act No. 53 of 1976), the Agricultural Pests Act, 1983 (Act No. 36 of 1983) and the environment conservation regulations. 7) A land user shall control any category 2 plants that occur on any land or inland water surface in contravention of the provisions of sub-regulation (1) by means of the methods prescribed in regulation 15E. 8) Unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. **Combating of category 3 plants (Section 15C) according to CARA (Act No 43 of 1983)**	

	1) Category 3 plants shall not occur on any land or inland water surface other than in a biological control reserve. 2) Subject to the provisions of sub-regulation (3), the provisions of sub-regulation (1) shall not apply in respect of category 3 plants already in existence at the time of the commencement of these regulations. 3) (a) No land user shall allow category 3 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. (b) The executive officer may impose such additional conditions as may reasonably be deemed necessary with regard to category 3 plants already in existence at the time of the commencement of these regulations. (c) A land user must take all reasonable steps to curtail the spreading of propagating material of category 3 plants. (d) The executive officer may, after consultation with the land user, issue a direction in terms of section 7 of the Act that category 3 plants in existence at the time of the commencement of these regulations must be controlled by means of the measures prescribed in regulation 15F. 4) No person shall, except in or for purposes of a biological control reserve – a. plant, establish, maintain, multiply or propagate category 3 plants; b. import or sell propagating material of category 3 plants or any category 3 plants; c. acquire propagating material of category 3 plants or any category 3 plants. 5) The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-regulations (1), (3) and	

	(4) on such conditions as the executive officer may determine in each case. **The executive officer may, on good cause shown in writing by the land user, grant written exemption from compliance with one or more of the requirements of sub-regulations (1), (3), (5), (6), (8) and (9) on such conditions as the executive officer may determine in each case.**	
National Environmental Management: Protected Areas Act (31 of 2004) and its subsequent amendments.	The purpose of this Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. The objectives of this Act are- • To provide, within the framework of national legislation, including the National Environmental Management Act, for the declaration and management of protected areas; • To provide for co-operative governance in the declaration and management of protected areas; • To effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity; • To provide for a representative network of protected areas on state land, private land and communal land; • To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas; • To promote participation of local communities in the management of protected areas, where appropriate; and • To provide for the continued existence of South African National Parks.	• The application does not fall within 5 km of any protected areas, however the following formally protected areas are present within the surrounding areas: ○ Madikwe Nature Reserve (25 km west); ○ Pilanesberg Provincial Nature Reserve and National Park (25 km south east); and ○ Atherstone Nature Reserve (30 km north).
North West Biodiversity Management Act (Act	The purpose of this Act is to provide for - (a) the management, promotion and protection of the biological diversity in the Province and the components of such biological	• An Alien Invasive Plant Management Plan must be developed as part of the proposed projects Environmental Management

No. 4 of 2016)	diversity; (b) the use of biological resources in a sustainable manner; (c) the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries; rehabilitation facilities, wildlife traders, wildlife translocators, professional hunters, hunting outfitters and hunting schools in the Province; (d) the prohibition of specific restricted activities involving specific listed species; (e) the protection of wild and captive populations of listed species; (f) the consolidation of biodiversity legislation in the Province; (g) the prevention of unauthorised introduction and spread of alien and listed invasive species to ecosystems and habitats where they do not naturally occur; (h) the management and control of alien species and listed invasive species to prevent or minimise harm to the environment and to biodiversity in particular; (i) the eradication of alien and listed invasive species from ecosystems and habitats where they may harm such ecosystems or habitats; (j) the protection of habitat of all listed specially protected and ordinary species; (k) the regulation of the issuing of permits and licenses authorizing (i) restricted activities involving specimens of – (aa) listed species in terms of section 13(1); (bb) CITES listed species; (cc) extra- limital species in terms of section 28(1); (dd) listed invasive species in terms of section 30(1); (ii) restricted activities involving aquatic systems in terms of section 12; (iii) restricted activities involving vegetation within 32 metres from the high watermark on either side of a watercourse in terms of section 10;	Programme (EMPr) in accordance with NWBMP. • No protected species may be damaged or destroyed without a permit.

	(vi) activities regulated in terms of a notice published in terms of section 25(1)(b); and (I) the regulation of the registration of persons and facilities in terms of section 38, and (m) the creation of an enabling environment for transformation of the biodiversity sector.	
North West Biodiversity Sector Plan (2015)	The North West Biodiversity Sector Plan identifies a network of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the province based on a systematic biodiversity plan. The aim of the Biodiversity Sector Plan is to identify the minimum area necessary to conserve and maintain biodiversity and major ecological infrastructure in the province. Where possible, it is spatially aligned with other relevant spatial plans for the province, such as the Provincial Spatial Development Framework and gazetted Environmental Management Frameworks.	The application area falls within a CBA 2 and ESA 1
Provincial, Regional and Municipal Plans	In addition, the following guidelines and documents are relevant to the project: • Bonjanala District Municipality Spatial Development Plan • Bonjanala District Municipality Integrated Development Plan • Moses Kotane Local Municipality (MKLM) Spatial Development Plan • MKLM Integrated Development Plan • North West Spatial Development Plan (November 2011)	

4.2 Species of Conservation Concern

Important national and provincial legislation relating to the protection of species is detailed below.

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

The National Environmental Management: Biodiversity Act (No. 10 of 2004), (NEM:BA) aims to establish national norms and standards for the management of biodiversity across all sectors and by different management authorities.

Chapter 4, Part 2 of the Biodiversity Act provides for listing of species as threatened or protected. If a species is listed as threatened, it must be further classified as critically endangered, endangered or vulnerable. The Act defines these classes as follows:

Table 4.2: NEM:BA classes and explanations

Critically endangered species	Any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
Endangered species	Any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
Vulnerable species	Any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
Protected species	Any species which is of such high conservation value or national importance that it requires national protection". Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

4.2.2 North West Biodiversity Management Act (Act No. 4 of 2016)

Schedule 2 of the North West Biodiversity Management Act (Act No. 4 of 2016) lists protected species within the province. Refer to Appendix 2 for a list of Schedule 2 protected species.

The NWBMA (Act No. 4 of 2016) has repealed the following legislation:

- Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974);
- Bopuhuthatswana Nature Conservation Act (Act No. 3 of 1973);
- Transvaal Nature Conservation Ordinance (No. 12 of 1983); and
- Cape Problem Animal Control Ordinance (No. 26 of 1957).

Implications for the proposed prospecting:

- Any species identified during this site survey that are listed by NEM:BA and/or NWBMA will require permits prior to removal and prior to commencement of prospecting.
- Permits will need to be acquired prior to prospecting activities for any protected species (NEM:BA and NWBMA) that may be affected by the any prospecting activities.

4.2.3 1976 List of Protected Trees (Government Gazette No. 9542 Schedule A) in the 1998 National Forest Act (NFA) as amended in November 2014:

The National Forest Act's (1998, as amended) List of Protected Trees identifies a number of trees within South Africa that are protected and thus deemed SCCs. No person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, unless a permit has been acquired.

Implications for the proposed prospecting:

- Any species identified during this site survey that are listed by NFA will require permits prior to removal and prior to commencement of prospecting.

4.2.4 South African Red Data List

The South African Red List of plants use the internationally recognised IUCN Red List Categories and Criteria to measure a species risk of extinction (Table 4.3). Since the Red List of South African plants are used widely for conservation practices throughout South Africa, this list has been utilised to identify species that are at low risk of extinction but of high conservation importance.

Table 4.3: South African Red Data List Categories (SANBI, 2016)

EXTINCT (EX)	A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
EXTINCT IN THE WILD (EW)	A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
REGIONALLY EXTINCT (RE)	A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
CRITICALLY ENDANGERED, POSSIBLY EXTINCT (CR PE)	Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for

	classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
CRITICALLY ENDANGERED (CR)	A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
ENDANGERED (EN)	A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
VULNERABLE (VU)	A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
NEAR THREATENED (NT)	A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable, and is therefore likely to become at risk of extinction in the near future.
CRITICALLY RARE	A species is Critically Rare when it is known to occur at a single site, but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
RARE	A species is Rare when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the IUCN criteria. The four criteria are as follows: • Restricted range: Extent of Occurrence (EOO) <500 km^2, OR • Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km^2, OR • Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR • Small global population: Less than 10 000 mature individuals.
RARE DECLINING	A species is Declining when it does not meet or nearly meet any of the five IUCN criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline of the species.
LEAST CONCERN	A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the

	above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
DATA DEFICIENT – INSUFFICIENT INFORMATION (DDD)	A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required and that future research could show that a threatened classification is appropriate.
DATA DEFICIENT – TAXONOMICALLY PROBLEMATIC (DDT)	A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
NOT EVALUATED (NE)	A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species included in Plants of southern Africa: an online checklist, are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.
THREATENED	Threatened species are species that are facing a high risk of extinction. Any species classified in the IUCN categories Critically Endangered, Endangered or Vulnerable is a threatened species.
SPECIES OF CONSERVATION CONCERN (SCC)	SCC are species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare, Rare, Declining and Data Deficient - Insufficient Information (DDD).
SENSITIVE SPECIES	Species not falling in the categories above but listed in: Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).
ENDEMIC SPECIES	Species endemic to South Africa, and more specifically to the North West Province.

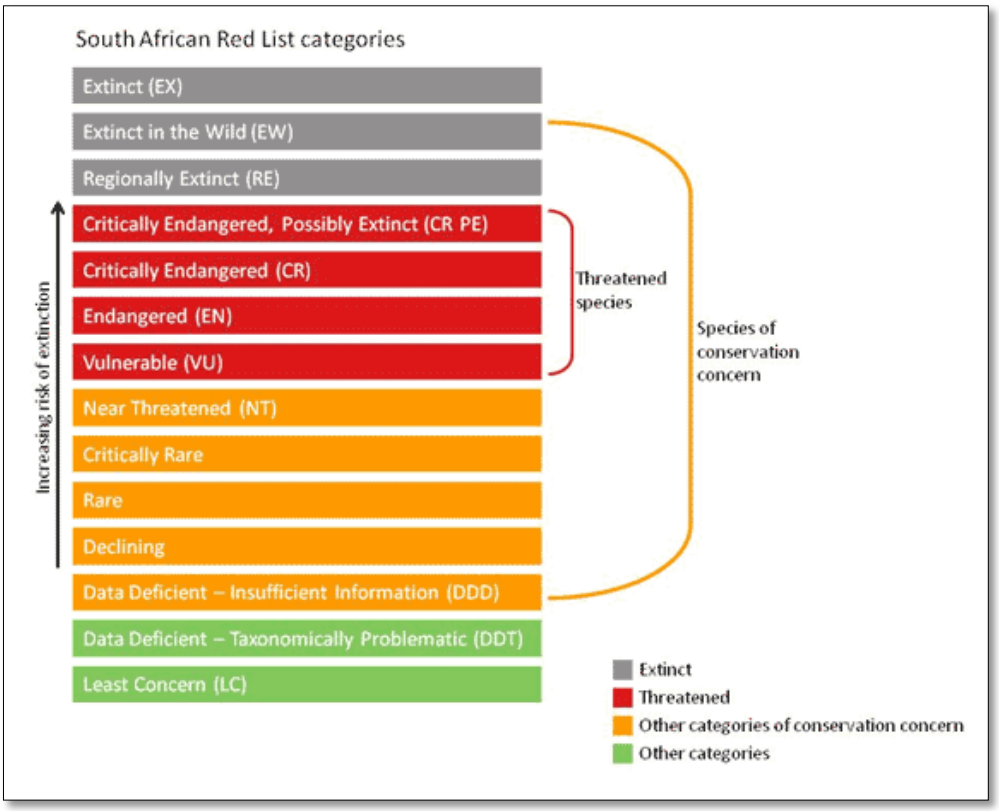

Figure 4.1: IUCN Categories ranked according to status (Source: SANBI, 2016: http://redlist.sanbi.org/redcat.php)

Implications for prospecting:

- Appendix 2 provides a comprehensive list of species observed and expected to be found within the study area.
- Relevant permits/licences will have to be obtained prior to the removal of the SCCs listed in the relevant legislation of this section, should any of these be disturbed, damaged or destroyed.

4.3 Biodiversity Conservation

The North West Biodiversity Sector Plan (NWBSP) (2015) identifies a network of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the province based on a systematic biodiversity plan. Collectively, the CBAs and ESAs cover 57% of the North West Province. Table 4.4 below details the various CBA Map categories and associated land management objectives:

Table 4.4: NWBSP (2015) CBA categories and land management guidelines

CBA MAP CATEGORY	LAND MANAGEMENT OBJECTIVE
Protected Area	As per protected area management plan
Critical Biodiversity Area 1 (CBA 1)	**Maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process:** • Ecosystems and species fully or largely intact and undisturbed. • These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met. • These are biodiversity features that are at, or beyond, their limits of acceptable change.
Critical Biodiversity Area 2 (CBA 2)	**Maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process:** • Ecosystems and species fully or largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of meeting biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve biodiversity targets, although loss of these sites would require alternative sites to be added to the portfolio of CBAs. • These are biodiversity features that are approaching but have not passed their limits of acceptable change.
Ecological Support Area 1 (ESA 1)	**Maintain in at least a semi-natural state as ecologically functional landscapes that retain basic natural attributes:** • Ecosystem still in a natural, near-natural state or semi-natural state, and has not been previously developed. • Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
Ecological Support Area 2 (ESA 2)	**Maintain as much ecological functionality as possible (generally these areas have been substantially modified):** • Maintain current land use or restore area to a natural state. • Ecosystem NOT in a natural or near-natural state, and has been previously developed (e.g. ploughed). • Ecosystems significantly disturbed but still able to maintain some ecological functionality. • Individual species or other biodiversity indicators are severely disturbed or reduced and these are areas that have low irreplaceability with respect to biodiversity pattern targets only. • These are areas with low irreplaceability with respect to biodiversity pattern targets only. These areas are required to maintain ecological processes especially landscape connectivity.
Other Natural Areas and No Natural Habitat Remaining	**Production landscapes:** • Manage land to optimise sustainable utilisation of natural areas.

The NWBSP (2015) further recommends land use zones and associated activities in relation to the CBA map categories, as shown in Table 4.5 below.

Table 4.5: Land use zone guidelines

NO	LAND USE ZONE	ASSOCIATED LAND USE ACTIVITIES	PA/CA	CBA1	CBA2	ESA1	ESA2	ONA
15	Quarrying and Mining	Prospecting and Underground Mining	N	N	R	R	R	R
		Quarrying and open-cast mining (includes surface mining, dumping & dredging).	N	N	N	N	N	R
		Hydraulic Fracturing (fracking)	N	N	N	R	R	R

Notes:
1. Guidelines apply only to natural or near-natural land with natural vegetation cover within each category (on site).
2. Y = YES, permitted and actively encouraged activity;
3. N = NO, not permitted, actively discouraged activity; and,
4. R = RESTRICTED to compulsory, site-specific conditions & controls when unavoidable, not usually permitted.

4.4 Provincial, District and Municipal Plans

Additional spatial and development plans that have been considered are as follows:

- Bonjanala District Municipality Spatial Development Plan;
- Bonjanala District Municipality Integrated Development Plan;
- Moses Kotane Local Municipality (MKLM) Spatial Development Plan;
- MKLM Integrated Development Plan;
- North West Spatial Development Plan (November 2011); and
- North West Biodiversity Sector Plan (2015).

5 DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

In terms of Appendix 6 of the EIA Regulations (as amended in 2017) a specialist report must contain-

(f) Details of an assessment of a specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure inclusive of a site plan identifying alternatives;
(g) An identification of any areas to be avoided, including buffers.

5.1 Climate

The largest urban area in proximity to the proposed application area is Rustenburg. Rustenberg normally receives about 513 mm of rain per year, with most rainfall occurring during mid-summer. The chart below (lower left) shows the average rainfall values for Rustenburg per month. It receives the lowest rainfall (0 mm) in June and the highest (101 mm) in January. The monthly distribution of average daily maximum temperatures (center chart below) shows that the average midday temperatures for Rustenburg range from 19.3°C in June to 29.4°C in January. The region is the coldest during July when the mercury drops to 1.7°C on average during the night. The chart below (lower right) provides an indication of the monthly variation of average minimum daily temperatures.

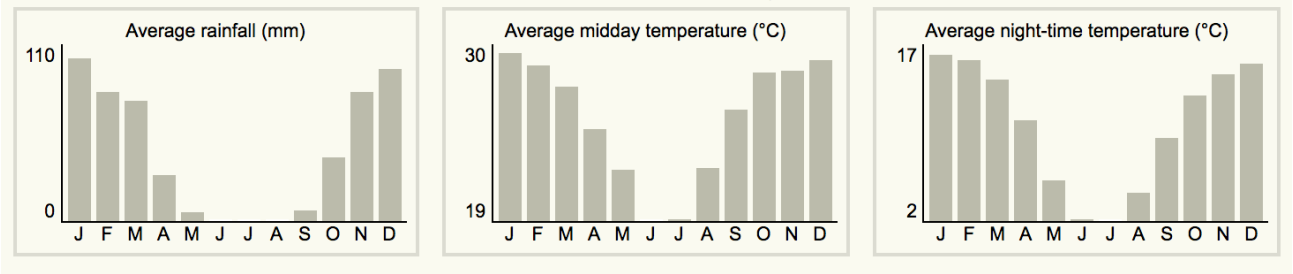

Figure 5.1: Graphs (from left to right) showing the average monthly rainfall; average monthly midday temperature; and average monthly night-time temperatures for Butterworth (SA Explorer, 2015).

5.2 Topography

The general topography of the broader study area is relatively flat with a gradual increase in elevation towards the north of the application area (Figure 5.2).

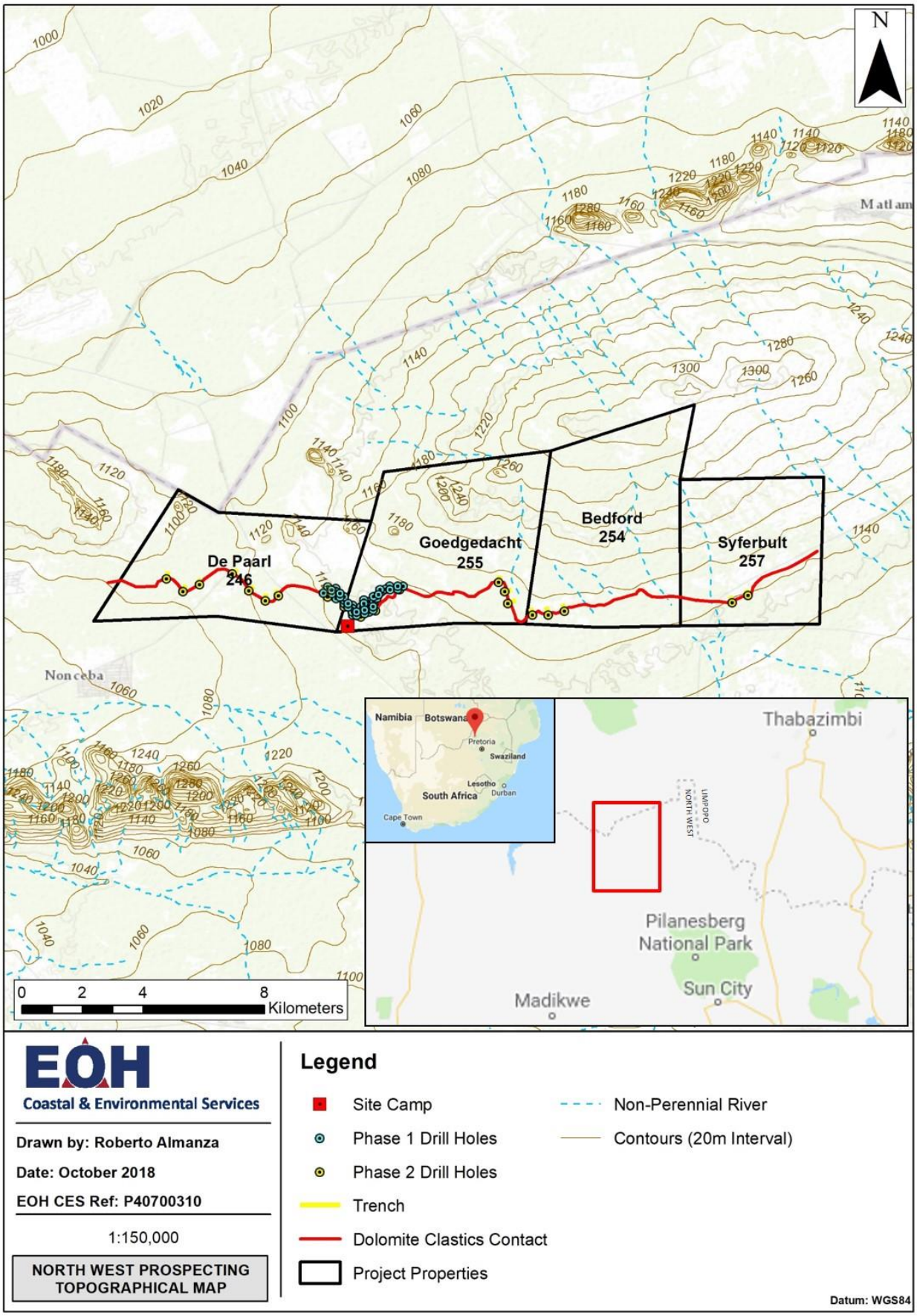

Figure 5.2: Showing topography of the general area.

Figure 5.3 below shows the east - west elevation profile of the application area along the length of the proposed drill sites. The application area is roughly 21 km long with an average elevation of 1134 m ranging from 1084 m in the west to 1129 m in the east of the application area. The maximum elevation within is 1170 m.

Figure 5.3: East – West elevation profile of the application area

Figure 5.4 shows the north – south elevation profile for the application area. The average elevation of 1179 m ranges from 1197 m in the north to 1136 m in the south of the application area. The maximum elevation is 1243 m.

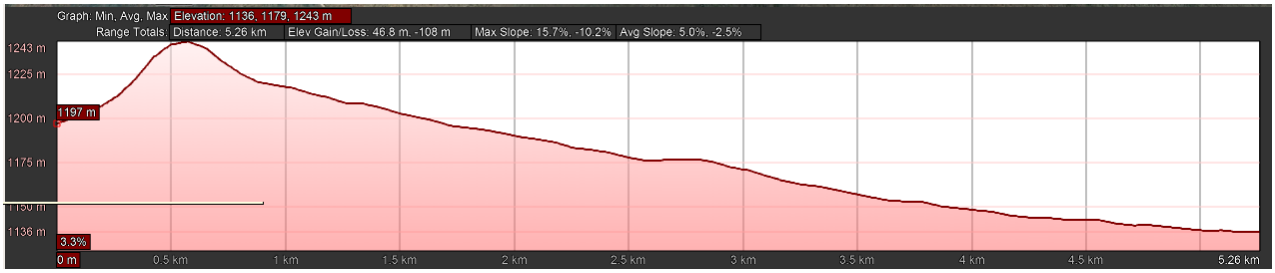

Figure 5.4: North – South elevation profile of the application area

5.3 Geology & soils

The following section details the underlying geology of the study area as well as the soil types found throughout.

5.3.1 Geology

The northern portion of the application area falls within the Malmani Dolomite Subgroup of the Chuniespoort Group of the Transvaal Supergroup. Geological dates for these rocks indicate that they were formed between 2.6-2.5 billion years ago, making this one of the oldest dolomite formations known.

The Malmani Subgroup is situated northwest of Johannesburg. It is characterized by basal quartz arenites, a thick succession of dolomites and upper iron formations. These materials contain high levels of calcium carbonate, and thus such rock formations are often referred to as carbonates.

The southern section of the application area falls within the Pretoria Group of the Transvaal Supergroup. This group is dominated by numerous alternating mudrock and sandstone units, and characterized by clastic sedimentary and volcanic rocks.

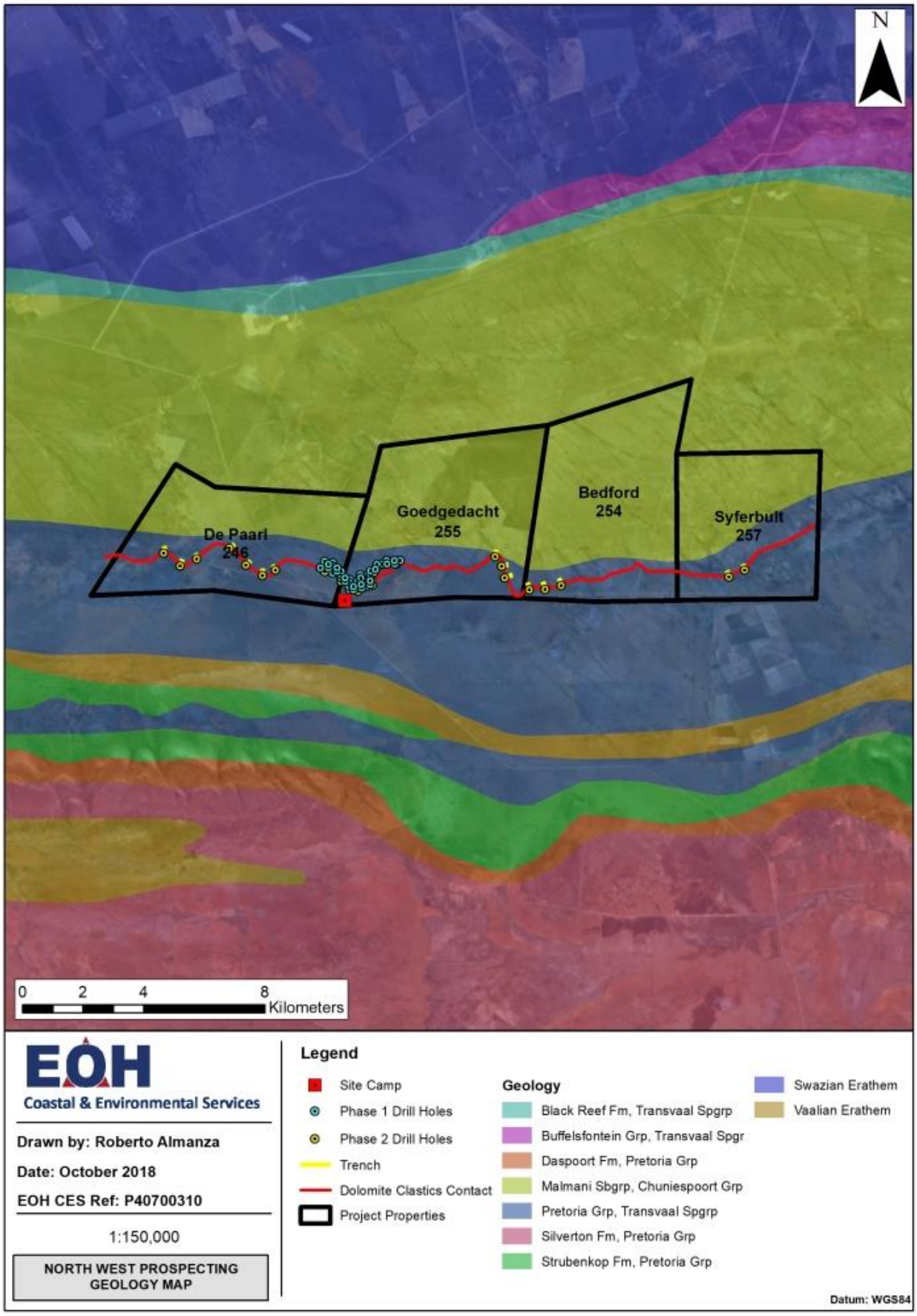

Figure 5.5: General geology of the study area.

5.3.2 Soils

The soils within the application area are classified as Lithic Leptosols in the northern portions (characterized by soils limited in depth by continuous coherent and hard rock within 10 cm of the surface), Ferric luvisols in the southern portions (iron rich soils) and calcic vertisols in the eastern portion (higher clay content in all horizons) (Figure 5.6 below).

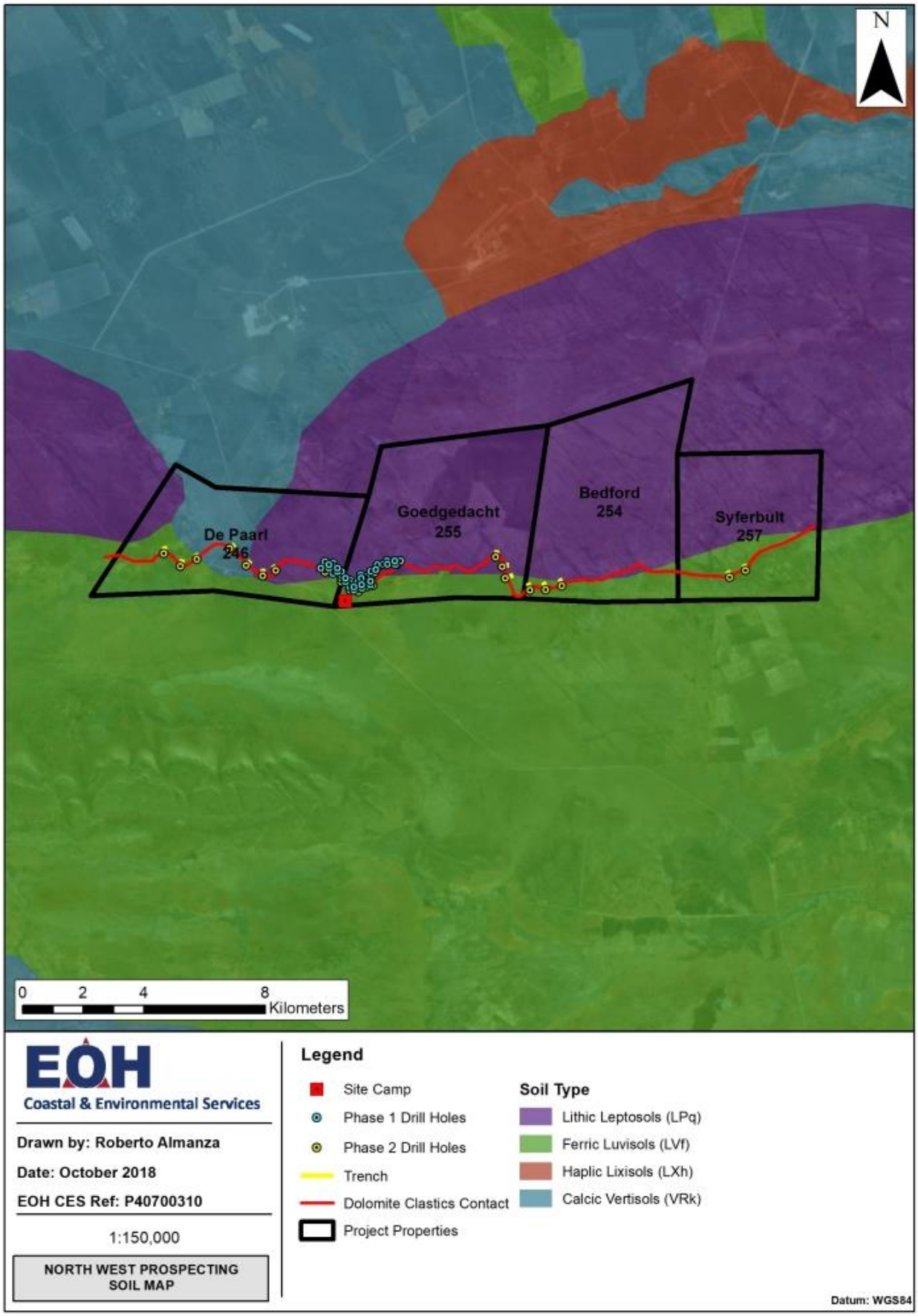

Figure 5.6: Soils map of the study area

5.4 Surface hydrology

No FEPA rivers are located within the study area, however a tributary of the Kolobeng River, is located to the south of the south western portion of the application area (Syferbult Farm). There are 4 NFEPA wetlands located within the application area. In addition to the above, a number of non-perennial tributaries (drainage lines) traverse the application area in a south easterly direction at various locations (Figure 5.7).

Figure 5.7: Surface hydrology of the application area.

5.5 Land use

The entire application area is classified as natural landscape (Figure 5.9). Other surrounding land uses include:

- Cultivated land;
- Settlement (Urban); and
- Mining.

Correspondence with local community members confirmed that majority of the application area is managed as communal grazing land. This was evident during the site visit, as livestock pens and water points were scattered throughout. The natural vegetation has been heavily impacted by overgrazing as depicted in Figure 5.8 below.


Figure 5.8: Livestock infratracture and evidence of overgrazing

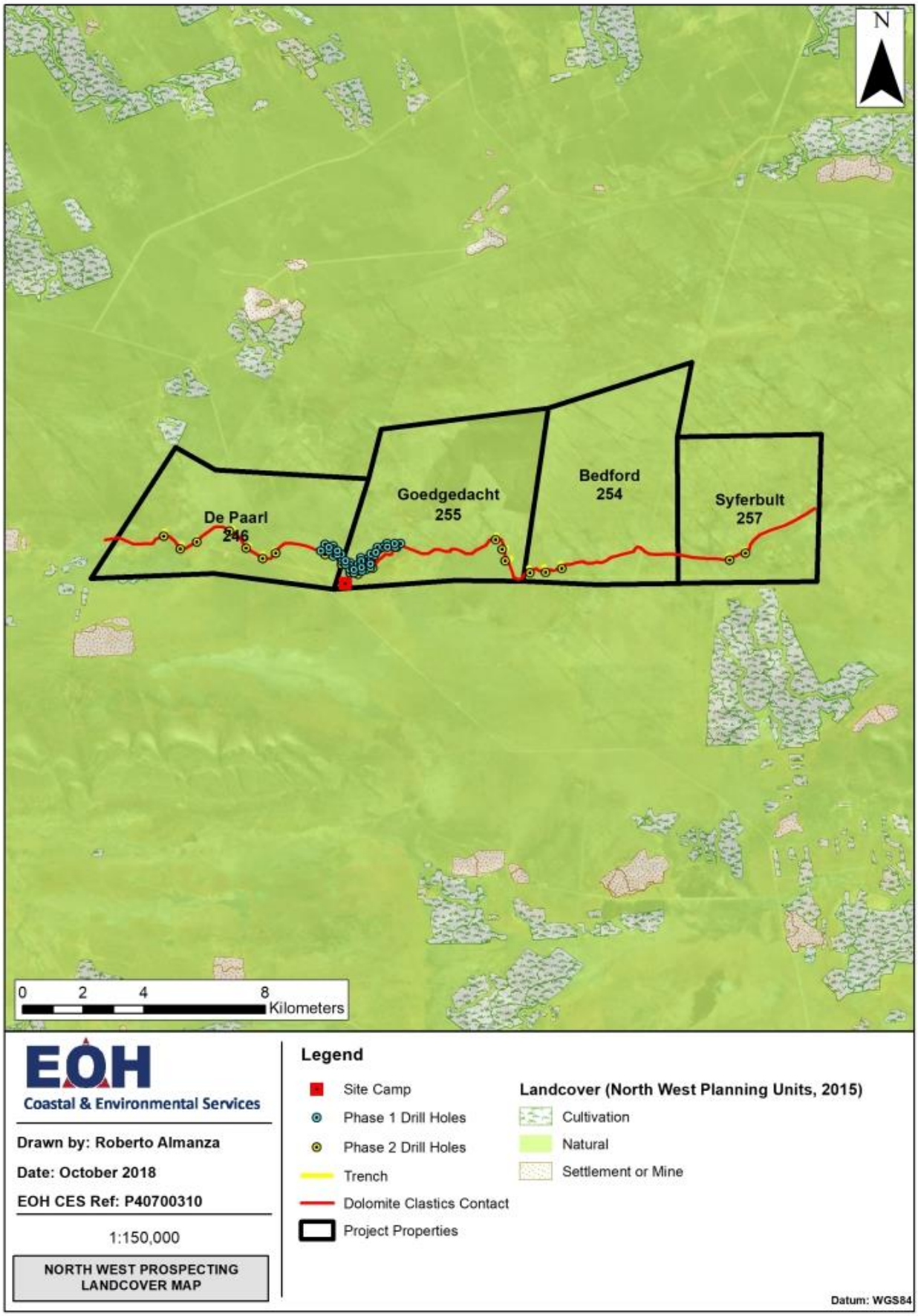

Figure 5.9: Land use of the application area.

6 DESCRIPTION OF THE BIOLOGICAL ENVIRONMENT

In terms of Appendix 6 of the Amended EIA Regulations (2017) a specialist report must contain:

(f) Details of an assessment of a specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure inclusive of a site plan identifying alternatives;
(g) An identification of any areas to be avoided, including buffers.

6.1 Vegetation

The prospecting application area falls within the Savanna Biome as per the SANBI classification (Mucina and Rutherford, 2006). The Savanna Biome is the largest biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe. It is characterized by a grassy ground layer and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as Shrubveld, where it is dense as Woodland, and the intermediate stages are known locally as Bushveld.

Majority of the prospecting application area falls within the Madikwe Dolomite Bushveld, with a small portion falling within the Dwaalboom Thornveld of the Savanna Biome (Figure 6.1 below).

6.1.1 Madikwe Dolomite Bushveld

The Madikwe Dolomite Bushveld can be found on gentle ridges and low hills up to about 100–150 m above the surrounding plains. Tree and shrub layers are often not clearly distinct, especially on steeper slopes. The vegetation is dominated by deciduous trees, particularly *Combretum apiculatum* and *Kirkia wilmsii* (especially in the east). It has a continuous herbaceous layer dominated by grasses. Plant species that dominate are:

Tall trees: *Sclerocarya birrea* subsp*. Caffra*
Small trees*: Combretum apiculatum, Kirkia wilmsii, Ozoroa paniculosa, Rhus lancea, Combretum imberbe, Rhus leptodictya, Ximenia americana, Ziziphus mucronata.*
Tall Shrubs: *Grewia flava, Tarchonanthus camphoratus, Vitex zeyheri, Clerodendrum glabrum, Grewia bicolor, G. monticola.*
Graminoids*: Enneapogon scoparius, Heteropogon contortus, Aristida congesta, Panicum coloratum, P. maximum*

SANBI classifies the Madikwe Dolomite Bushveld as **LEAST THREATENED** with 17% statutorily conserved in the Madikwe Nature Reserve. Only 1% is transformed from cultivation and erosion is low to very low.

6.1.2 Dwaalboom Thornveld

The Dwaalboom Thornveld is characterized by plains with layer of scattered, low to medium high, deciduous *microphyllous* trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. Plant species that dominate are:

Tall Trees: *Acacia erioloba.*
Small Trees*: Acacia erubescens, A. nilotica, A. tortilis* subsp*. heteracantha, A. fleckii, A. mellifera subsp. detinens, Combretum imberbe, Rhus lancea, Ziziphus mucronata.*
Tall Shrubs: *Acacia hebeclada* subsp*. hebeclada, Combretum hereroense, Diospyros lycioides* subsp*. lycioides, Euclea undulata, Grewia flava, Tarchonanthus camphoratus.*
Low Shrubs*: Acacia tenuispina, Abutilon austro-africanum, Aptosimum elongatum, Hirpicium bechuanense, Pavonia burchellii, Solanum delagoense.*
Succulent Shrubs: *Kalanchoe rotundifolia, Talinum caffrum.*
Herbaceous Climber: *Rhynchosia minima.*
Graminoids*: Aristida bipartita, Bothriochloa insculpta, Digitaria eriantha* subsp*. eriantha, Ischaemum afrum, Panicum maximum, Cymbopogon pospischilii, Eragrostis curvula, Sehima galpinii, Setaria incrassata.*
Herbs: *Heliotropium ciliatum, Kohautia caespitosa* subsp*. brachyloba, Nidorella hottentotica*

SANBI classifies Dwaalboom Thornveld as **LEAST THREATENED** with 6% statutorily conserved, mostly within the Madikwe Game Reserve. About 14% has been transformed by cultivation. Erosion is generally very low to low, and is mainly used for extensive cattle grazing.

The However, the North West Biodiversity Sector Plan (NWBSP) (2015) uses the results from an assessment of the provincial land cover by Desmet and Schaller (2015), which categorises the Dwaalboom Thornveld as **VULNERABLE.**

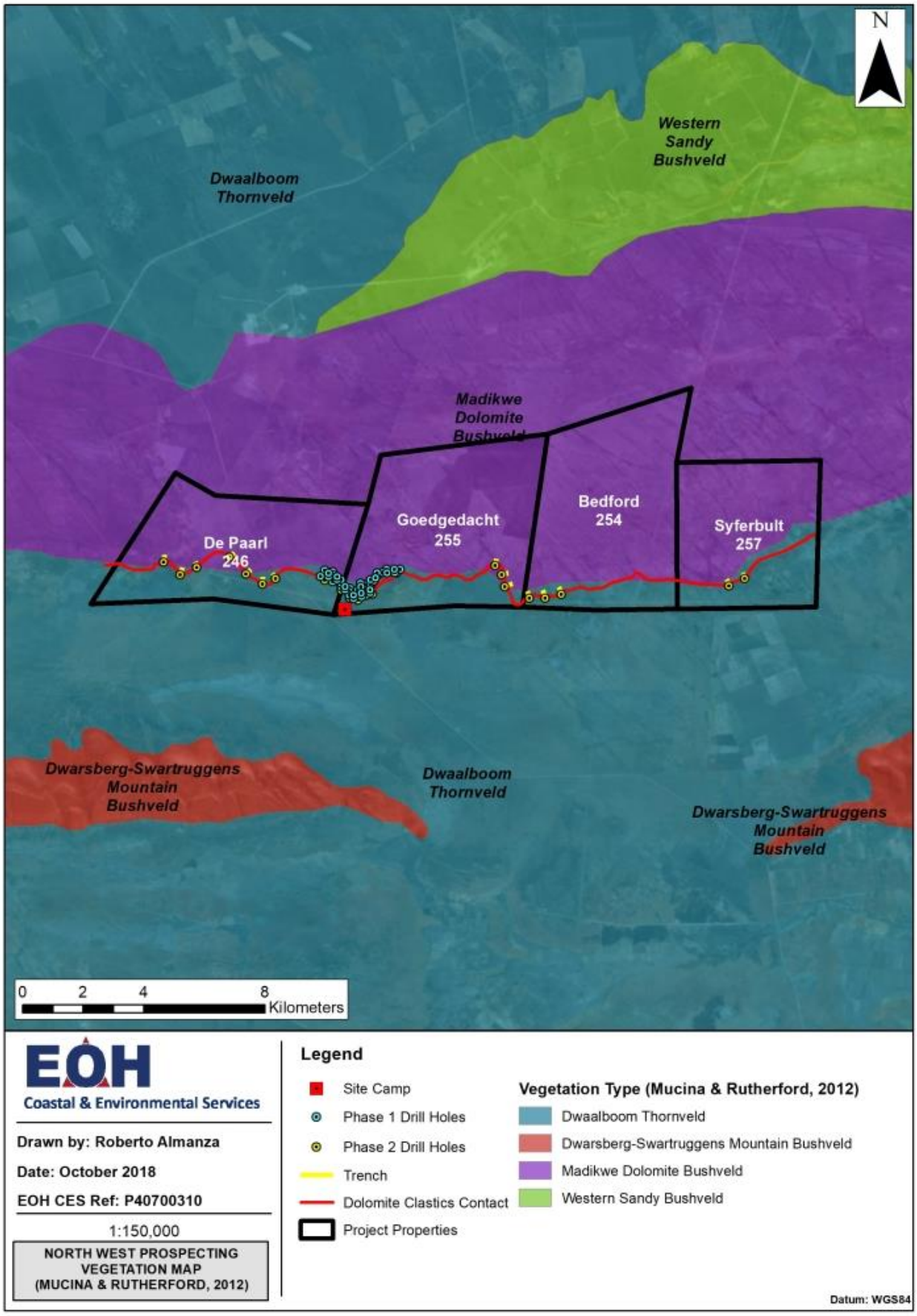

Figure 6.1: Vegetation map of the application area.

6.2 Biodiversity Conservation

The following section details the various biodiversity planning and management tools applicable to the application area.

6.2.1 Critical Biodiversity Areas

Portions of the application area fall within a CBA 2 and ESA 1. In particular, the proposed activities are located as follows:

Table 6.1: Prospecting activities in relation to CBA types

CBA Type	Drill Holes	Trenches
CBA 2	13	8
ESA 1	52	7
None	5	5
Total	**70**	**20**

Based on the recommended land use zones (as detailed in Section 4.3 above), prospecting within these areas should be restricted with site-specific conditions applied. Therefore, the mitigation measures detailed in Section 10.4 below should be adhered to and implemented.

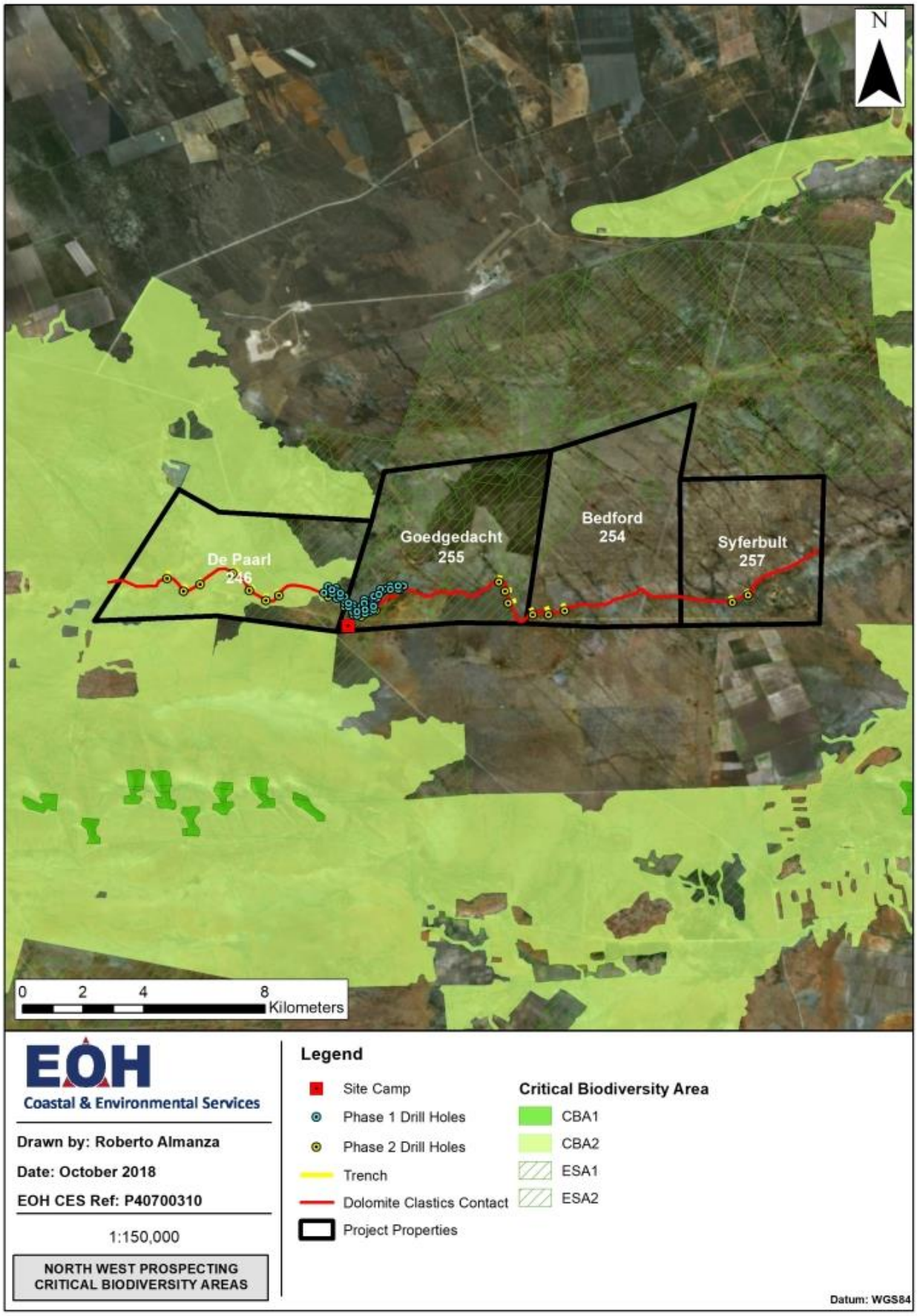

Figure 6.2: CBA map of the application area.

6.2.2 Protected areas

The application area is not located within any formally protected areas, however it is located in close proximity to the following formally protected areas (Figure 6.3):

- Madikwe Nature Reserve (25 km west)
- Pilanesberg Provincial Nature Reserve and National Park (25 km south east)
- Atherstone Nature Reserve (30 km north)
- Marakele National Park (68 km north east)
- Important Bird Area (IBA) Northern Turf Thornveld (23 km east) (Figure 6.4)
- Important Bird Area (IBA) Pilansberg National Park (23 km east) (Figure 6.4)

The application area does not fall within any area delineated as a National Protected Areas Expansion Strategy (NPAES) focus area (Figure 6.4).

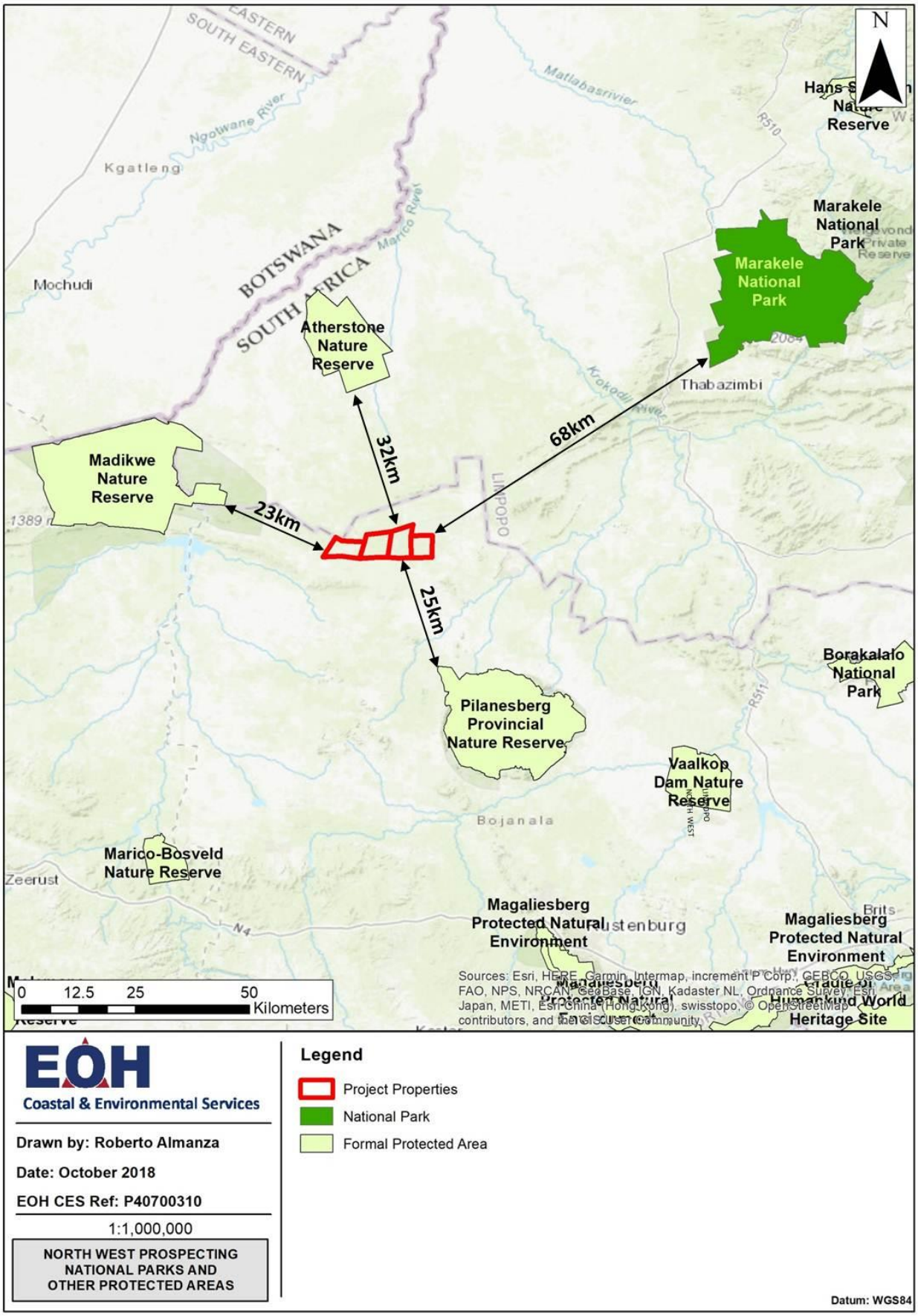

Figure 6.3: Protected areas surrounding the application area

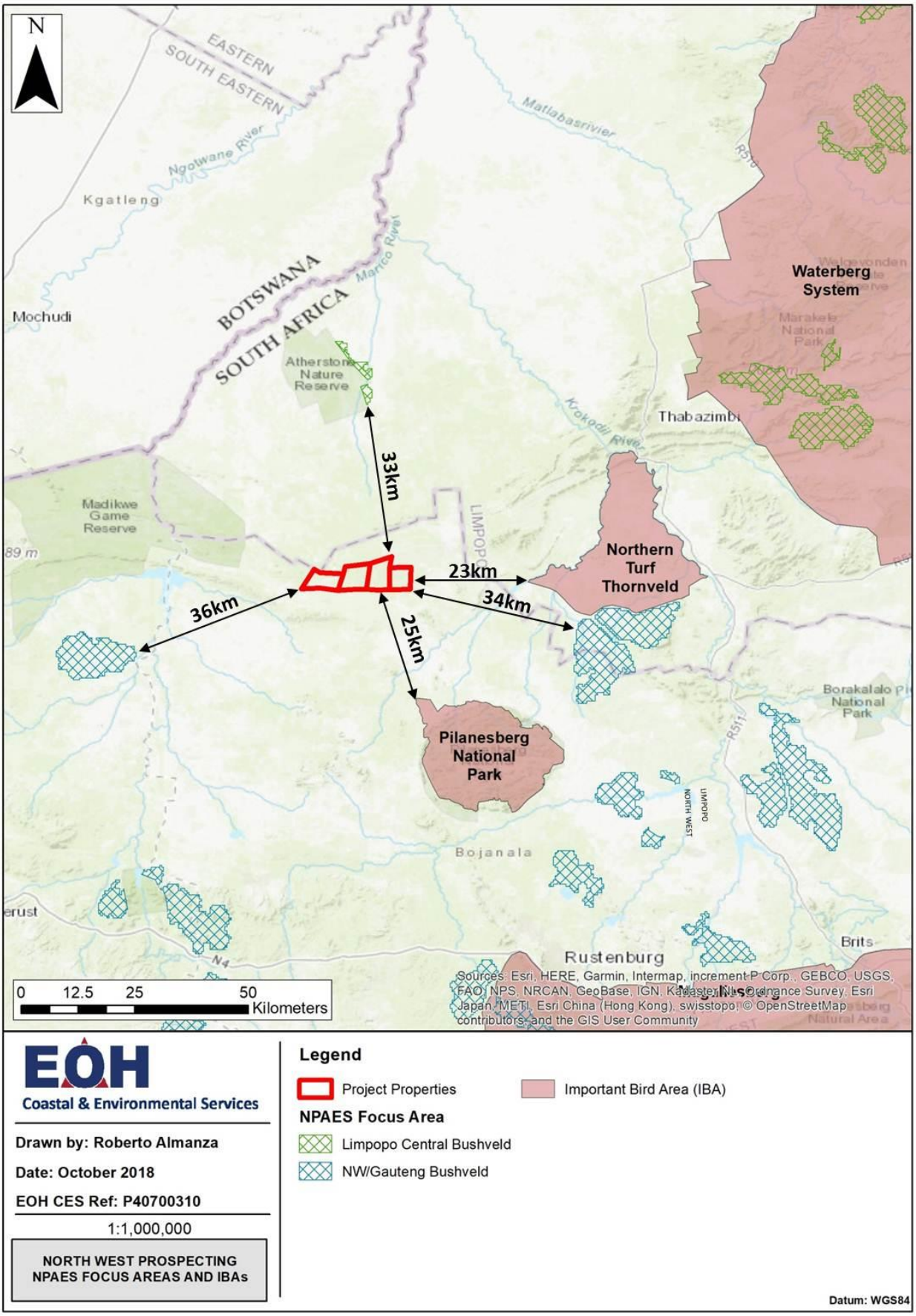

Figure 6.4: NPAES and IBAs surrounding the application area

6.3 Species of Special Concern

The following sections details Species of Conservation Concern (SCC) which may be found within the application area.

6.3.1 Conservation Status of Plant Species: Rare, Endangered or Threatened species

The following list of potential plant SCC were derived from current literature for vegetation found in the area as well as the international IUCN Red Data list, the South African Red Data List, DAFF protected trees, and the NWBMA (Act No. 4 of 2016) Schedule 2: Protected species list . The results are summarised in Table 6.2 below.

Table 6.2: List of potential plant SCC that may be found onsite

FAMILY	GENUS & SPECIES	COMMON NAMES	STATUS
ACANTHACEAE	*Barleria media*	Mr McKen's barleria, Bosviooltjie	V (Red List)
AIZOACEAE	*Frithia pulchra*	Bobbejaanvingers, glasies, toontjies, fairy elephant's feet.	VU (IUCN)
ASPHODELACEAE	*Aloe peglerae*	Vuurpylaalwyn	EN (IUCN) & V (Red List)
APOCYNACEAE	*Brachystelma canum*		CE (Red List & IUCN)
	Brachystelma gracillimum		CE (Red List)
	Ceropegia insignis		E (Red List)
	Brachystelma incanum		V (Red List)
	Brachystelma dimorphum		V (Red List)
	Ceropegia stentiae		V (Red List)
	Miraglossum laeve		V (Red List)
ANACAMPSEROTACEAE	*Anacampseros dicapitata*		V (Red List & IUCN)
ANACARDIACEAE	*Searsia maricoana*		V (Red List)
ASTERACEAE	*Senecio holubii*		DD CE (Red List & IUCN)
DIOSCOREACEAE	*Dioscorea sylvatica*	Elephant's Foot, Elephant's Foot Yam, Wild Yam	VU (IUCN)
EUPHORBIACEAE	*Euphorbia knobelii*		E (Red List)
FABACEAE	*Pearsonia bracteata*		NT (IUCN)
LILIACEAE	*Aloe marlothii*	Mountain Aloe	CITES
LOBELIACEAE	*Lobelia cuneifolia var. ananda*		V (Red List)
ROSACEAE	*Prunus africana*	Red Stinkwood, African	V (Red List)

		Cherry	

Aloe peglerae

Anacampseros decapitata

Dioscorea sylvatica

Frithia pulchra

Barleria media

*Pearsonia bracteata (*synonym*: Lotononis bracteata Benth)*

Brachystelma canum

Brachystelma gracillimum

Ceropegia insignis

Brachystelma incanum

Brachystelma dimorphum (circinatum displayed)

Ceropegia stentiae

Miraglossum leave (pulchellum displayed)

Searsia maricoana (chirindensis displayed)

Senecio holubii (serratuloides)

Euphorbia knobelii

Lobelia cuneifolia var. ananda

Prunus africana

Aloe marlothii (*Mountain* Aloe)

Figure 6.5: Plant SCC's that may potentially occur onsite.

6.4 Fauna

South Africa has approximately 1,663 terrestrial vertebrate faunal species of which 850 species are birds, 343 species are mammals, 350 species are reptiles and 120 species are amphibians spread across seven biomes and 122 million km². The North West Province is home to approximately 109 reptile species, 39 amphibian species, 205 mammal species (ADU, 2018) and 549 bird species (Lepage, 2018). The study area is located within QDS 2426DC and 2426DD.

Reptiles

The North West Province has approximately 109 reptile species. The Table below illustrates the 12 of species recorded within QDS 2426DC and 2426DD within which the site is located (ADU, 2018). No SCC are likely to be found on site and all species situated with the two relevant QDSs are listed as of least concern (Bates et al. 2014).

Table 6.3: Reptile species likely to occur in the study area

Scientific name	Common name	Red list category
Acanthocercus atricollis	Southern Tree Agama	Least Concern
Chamaeleo dilepis	Common Flap-neck Chameleon	Least Concern
Cordylus vittifer	Common Girdled Lizard	Least Concern
Hemidactylus mabouia	Common Tropical House Gecko	Least Concern
Homopholis wahlbergii	Wahlberg's Velvet Gecko	Least Concern
Gerrhosaurus flavigularis	Yellow-throated Plated Lizard	Least Concern
Mochlus sundevallii	Sundevall's Writhing Skink	Least Concern
Nucras intertexta	Spotted Sandveld Lizard	Least Concern
Psammophis subtaeniatus	Western Yellow-bellied Sand Snake	Least Concern
Trachylepis punctatissima	Speckled Rock Skink	Least Concern
Trachylepis varia sensu lato	Common Variable Skink Complex	Least Concern
Varanus albigularis albigularis	Rock Monitor	Least Concern

(ADU, 2018)

Amphibians

Of the 39 species of amphibians known to occur in the North West Province, 15 have been recorded within QDS 2426DC and 2426DD within which the site is located (ADU, 2018) and are likely to occur in this study area. The table below lists these species together with their conservation status. One SCC (SARCA, 2014) is likely to occur within the study area (ADU, 2018). The Giant Bullfrog (Pyxicephalus adspersus) is listed as least concern on the IUCN red list. Based on desktop research the Giant Bull Frog occurs in habitats of seasonal shallow grassy pans, vleis and other rainfilled depressions in open flat areas of grass or savanna and for much of the year the species remains buried up to 1 m underground (du Preez & Cook, 2004). Threats include: habitat loss and illegal collection for local and international pet industries. Urbanization poses a major threat to this species as adults migrating to, and juveniles dispersing from, breeding sites are often killed on roads (du Preez & Cook, 2004).

Table 6.4: Amphibians with a distribution range that includes the study area

Scientific name	Common name	Red list category
Breviceps adspersus	Bushveld Rain Frog	Least Concern
Poyntonophrynus fenoulheti	Northern Pygmy Toad	Least Concern
Poyntonophrynus vertebralis	Southern Pygmy Toad	Least Concern
Schismaderma carens	Red Toad	Least Concern
Sclerophrys garmani	Olive Toad	Least Concern
Kassina senegalensis	Bubbling Kassina	Least Concern
Phrynomantis bifasciatus	Banded Rubber Frog	Least Concern
Phrynobatrachus natalensis	Snoring Puddle Frog	Least Concern
Ptychadena anchietae	Plain Grass Frog	Least Concern
Ptychadena mossambica	Broadbanded Grass Frog	Least Concern
Cacosternum boettgeri	Common Caco	Least Concern
Pyxicephalus adspersus	Giant Bull Frog	Least Concern
Pyxicephalus edulis	African Bull Frog	Least Concern
Tomopterna cryptotis	Tremelo Sand Frog	Least Concern
Chiromantis xerampelina	Southern Foam Nest Frog	Least Concern

(ADU, 2018)

Mammals

205 mammal species are known to occur in the North West Province. Approximately 57 mammal species have been recorded in QDS 2426DC and 2426DD within which the site is located (ADU, 2018).

Seven SCC occur within the two relevant QDSs, they include carnivores (serval, cheetah, leopard and hyena) and antelope (grey rhebok, and roan and sable antelope). The majority of these species are unlikely to occur on site given that they are likely to be restricted to the Game Reserves/Farms nearby however they may use the area to move across or forage.

The Grey Rhebok (Pelea capreolus) is native to South Africa and is known to occur in agricultural and natural areas in the North West. Grey Rhebok are partial to hilly grasslands situated close to water sources (Cowell and Drouilly, 2017). Sable Antelope (Hippotragus niger) is a savanna/woodland ecotone species which frequents woodland open enough to support an

understory of grasses in the wet season and grassland in the dry season (IUCN, 2017). Similar to Sable Antelope, Roan Antelope (Hippotragus equines) are associated with Savanna woodlands and grasslands and are a water-dependent grazer/browser (IUCN, 2017).

The Leopard (Panthera pardus) is widely distributed across Africa but has declining population numbers due to habitat fragmentation, reduced prey base, trophy hunting and conflict with livestock and game farming (Stein et al. 2016). Serval (Leptailurus serval) have a preference for grassland, wetland or habitats associated with water e.g. reed beds and riparian vegetation and tolerate agricultural areas provided cover is available.. Cheetah (Acinonyx jubatus) habitat ranges from open grasslands, woodland, arid regions and desert fringes (Durant, et al. 2015)

Table 6.5: Mammal SCC possibly occurring in the study area

Scientific Name	English Name	Red List status
Pelea capreolus	Vaal Rhebok	Near Threatened
Hyaena brunnea	Brown Hyena	Near Threatened
Leptailurus serval	Serval	Near Threatened
Hippotragus niger	Sable antelope	Vulnerable
Acinonyx jubatus	Cheetah	Vulnerable
Panthera pardus	Leopard	Vulnerable
Hippotragus equinus	Roan Antelope	Endangered

(ADU, 2018)

Birds

Approximately 434 bird species occur within the Bojanala District, North West Province.

17 species are of conservation concern occur in the Bojanala District of which 14 are likely to occur on site. The other three are specific to habitats that are not found on site e.g. permanent water sources.

The nearest Important Bird Area (IBA) is approximately 25-35 km away in the Pilansberg National Park and Northern Turf Thornveld. SCC dependent on the Pilansberg National Park include the Kori Bustard, Secretarybird (breeding in the park) and European Roller, as well as the regionally threatened Verreauxs' Eagle (breeding in the park), Lanner Falcon, African Finfoot, African Grass Owl, Yellow-billed Stork, Marabou Stork, Yellow-throated Sandgrouse, Kurrichane Thrush , White-throated Robin-chat, White-bellied Sunbird and Kalahari Scrub Robin. SCC dependent on the Northern Turf Thornveld include the Black-winged Pratincole, Yellow-throated Sandgrouse, Lanner Falcon, Kurrichane Thrush, White-throated Robin-Chat, Burchell's Starling, White-bellied Sunbird and Kalahari Scrub Robin.

Table 6.6: Bird SCC likely to occur in the study area

Scientific Name	English Name	Red List status	Likelihood
Ardeotis kori	Kori Bustard	NT	Dry open savannah woodland, dwarf shrub lands and occasionally grasslands.
Calidris ferruginea	Curlew Sandpiper	NT	Wetlands with muddy fringes
Circus macrourus	Pallid Harrier	NT	Grasslands associated with open pans or floodplains, also croplands.
Falco vespertinus	Red-footed Falcon	NT	Open semi-arid and arid savanna

Glareola nordmanni	Black-winged Pratincole	NT	A species preferring extensive open grassland, usually near wetlands. Often forages over agricultural land and pastures.
Limosa limosa	Black-tailed Godwit	NT	Rare/Accidental
Phoeniconaias minor	Lesser Flamingo	NT	Restricted to large alkaline pans and other inland water bodies.
Rynchops flavirostris	African Skimmer	NT	Rare/Accidental
Terathopius ecaudatus	Bateleur	NT	Semi-arid regions, Open and closed woodland.
Anthropoides paradiseus	Blue Crane	VU	Prefers open grasslands. Also forages in wetlands, pastures and agricultural land.
Polemaetus bellicosus	Martial Eagle	VU	Varied, from open karroid shrub to lowland savanna.
Oxyura maccoa	Maccoa Duck	VU	Large saline pans and shallow impoundments.
Sagittarius serpentarius	Secretary bird	VU	Prefers open grassland or lightly wooded habitat.
Torgos tracheliotos	Lappet-faced Vulture	EN	Semiarid open woodland
Aquila nipalensis	Steppe Eagle	EN	Favours open savannah woodland
Gyps coprotheres	Cape Vulture	EN	Gyps coprotheres
Trigonoceps occipitalis	White-headed Vulture	CE	Rare/Accidental
Gyps africanus	White-backed Vulture	CE	Breeds on tall, flat topped trees. Mainly restricted to large rural or game farming areas.

7 SITE OBSERVATIONS AND DESCRIPTIONS

While National level vegetation maps have described broad vegetation types, local conditions and micro-habitats (rainfall, soil structure, rocky outcrops, etc.) can result in variations in plant composition.

A site investigation was therefore conducted on the 27 September in order to confirm desktop findings, to assess the actual ecological state, current land-use, identify potential sensitive ecosystems and identify plant species associated with the proposed project activities. The site visit also served to inform potential impacts of the proposed project and how significantly it would impact on the surrounding ecological environment.

7.1 Vegetation

Two main vegetation units were identified to occur within the entire study area, namely the Madikwe Dolomite Bushveld and the Dwaalboom Thornveld vegetation.

Although majority of the application areas falls within the Madikwe Dolomite Bushveld, majority of the prospecting activities will occur within the Dwaalboom Thornveld. The Dwaalboom Thornveld falls under the Savanna Biome and consists of a grassland mosaic with scattered woody species or clumped trees & scrubs (refer to photographs below).

7.1.1 Observations:

- Species identified on site were predominantly *Acacia* species, namely *Acacia tenuispina*, *Acacia erioloba, Acacia erubescens, Acacia nilotica and Acacia tortilis.* Other species included a scattered layer of *Graminoids* (grasses), namely *Aristida bipartita* and *Eragrostis curvula.*
- The natural veld was very dry, which was evident by the bare *acacia* species noted on site.
- The study area was largely overgrazed by cattle.
- The species diversity of the habitat unit was low.
- The site was mostly degraded due to overgrazing or transformed due to clearing.

7.1.2 Conclusions:

The habitat integrity of the vegetation unit is degraded largely due to anthropogenic activities associated with the study area, such as livestock farming and overgrazing by cattle. This has resulted in a decrease in floral species diversity and abundance.

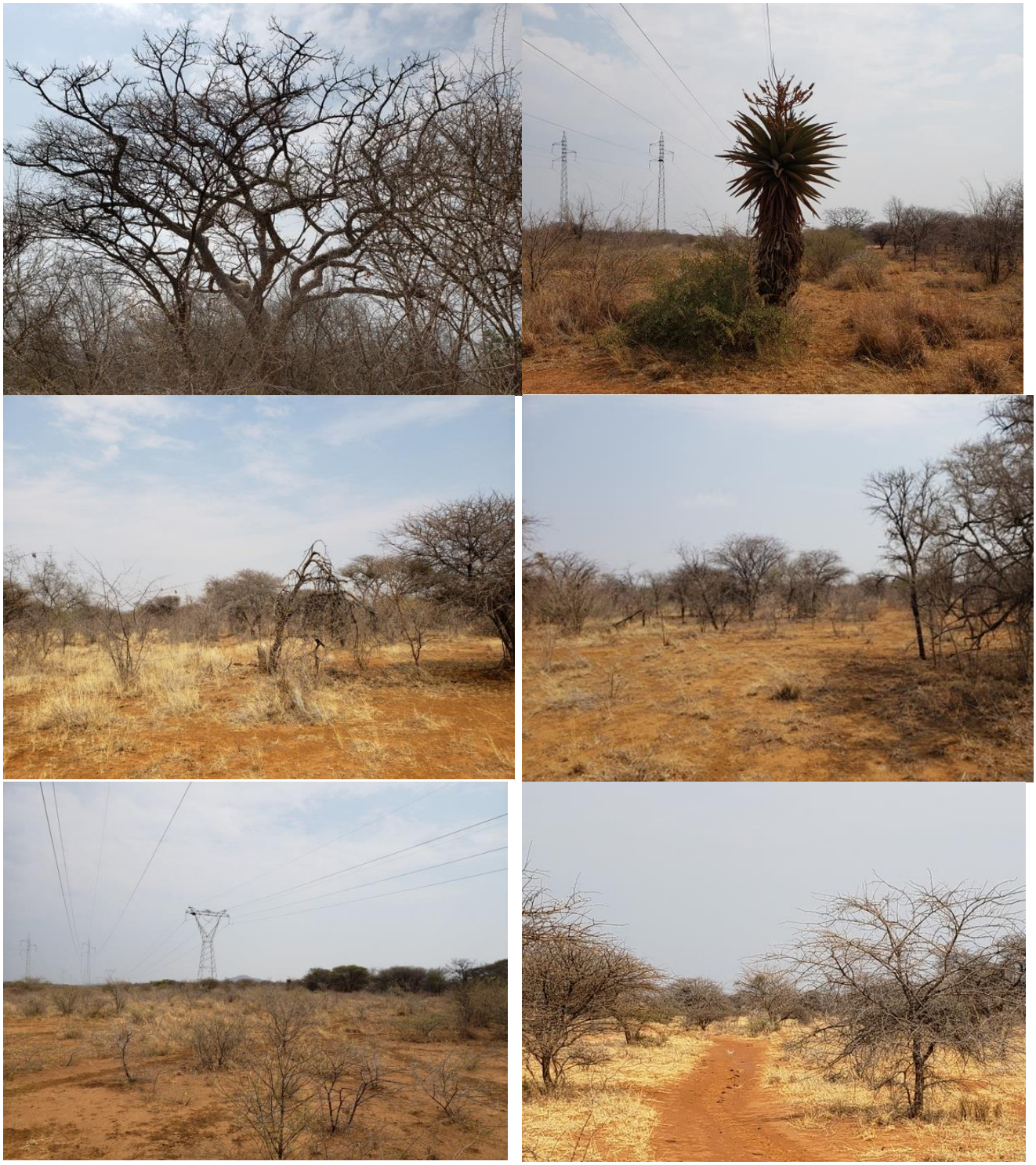

Figure 7.1: Site photographs showing the vegetation condition within the application area

7.2 Plant Species of Special Concern

It must be noted that due to the vast area under application, it is possible that not all existing floral SCC were encountered. In addition, it is possible that unidentified floral SCC may be present within the footprint of the proposed drill sites, trenches, and site camp.

7.2.1 Observations

Two *Aloe marlothii* were noted on the western portion of the application area. The locations of the two *Aloe marlothii's* observed on site are as follows:

Aloe marlothii 1: 24°54'44.91"S; 26°46'44.34"E
Aloe marlothii 2: 24°54'32.55"S; 26°44'45.32"E

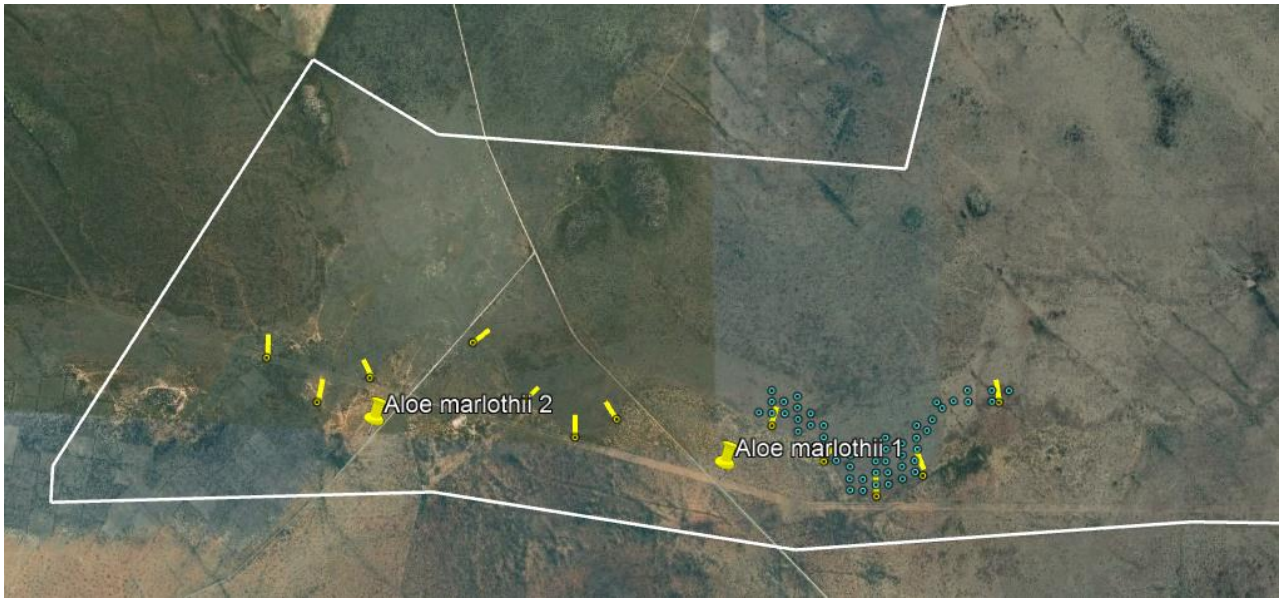

Figure 7.2: Locations of *Aloe marlothii* observed on site

7.2.2 Conclusions

Aloe marlothii present on site should be avoided. Where unavoidable, permits must be obtained prior to the commencement of activities on site. This species is listed in Appendix II of CITES which *"includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival".*

The habitat transformation encountered during the assessment, significantly lowers the probability of floral SCC occurring, and as such, the proposed development is not anticipated to have a significant impact on local and regional floral SCC conservation.

As the entire application area could not be feasibly surveyed for floral SCC. In addition, it is possible that unidentified floral SCC may be present within the footprint of the proposed drill sites, trenches, and site camp. Therefore, it is recommended that a walkthrough of the areas to be prospected (including the site camp) be undertaking by a suitably qualified individual prior to the commencement of prospecting in order to ensure that no floral SCC are damaged or destroyed during prospecting activities, and to take into account possible seasonality changes. This walkthrough should ideally be undertaken with the appointed contractor/geologist during the demarcation of the prospecting sites.

7.3 Fauna

It must be noted that it is not always feasible to identify or observe all species within an area during a site assessment due to the secretive nature of many faunal species, possible low population numbers or varying habits of species.

7.3.1 Observations:

No faunal SCC were encountered on site, however there was evidence of animal holes/burrows on site (Figures 7.3 and 7.4 below).

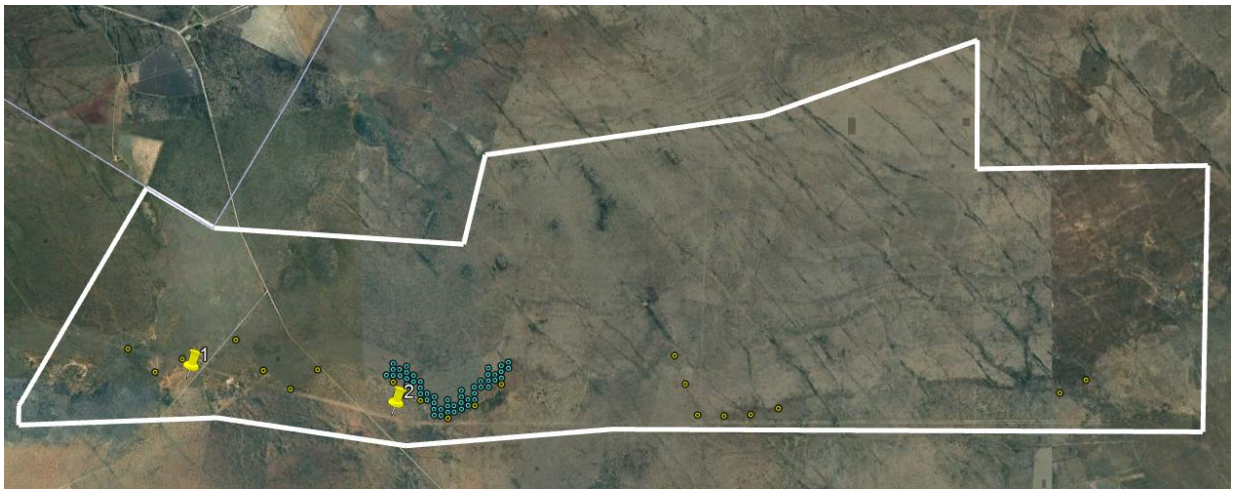

Figure 7.3: Location of animal burrows observed onsite.

Figure 7.4: Animal burrows observed within the application area (Site 1- left; Site 2 - right).

7.3.2 Conclusions

The proposed prospecting activities are unlikely to have a significant impact on listed faunal species that may occur in the area, due to the area being significantly degraded. The application area is situated within a larger open area, making it possible for individuals of such species to move away from the study area to other suitable habitat.

7.4 Alien invasive species observed

Alien species present on site and their category according to the NEMBA Alien and Invasive Species Regulations (published 1 August 2014) are presented below (Table 7.1). The CARA alien invasive list is only referenced were an alien invasive species that does not appear on the NEMBA list appears on the CARA list. In this case there were no such species.

No alien invasive plant species were observed on site, other than *Opuntia ficus-indica* (Prickly Pear), which was noted alongside the road which passes through De Paarl Farm. As the study area was noticeably dry, this may have an impact on the presence of alien invasive species in the area. Therefore, an Alien Invasive Plant Management Plan must be compiled and implemented during the prospecting and closure phase of the project, and that active management of identified and unidentified alien species listed as Category 1b are controlled.

Table 7.1. Alien invasive species present on site

Species	Comment
Category 1b	
Opuntia ficus-indica (Prickly Pear)	1) According to NEMBA category 1b Listed species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be contained. 2) A landowner upon whose land a Category 1 b Listed Invasive Species occurs and which species is under the landowner's control must: (a) comply with the provisions of section 73(2) of the Act; and (b) contain the listed invasive species in compliance with section 75 (1), (2) and (3) of the Act; 3) If an Invasive Species Management Programme has been developed in terms of regulation 7, a landowner must control the listed invasive species in accordance with such programme. 4) A landowner contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the containment of the listed invasive species, or compliance with the Invasive Species Management Programme contemplated in regulation 7.

Other potential alien invasive species that are likely to occur on site are listed below (Table 7.2).

Table 7.2: Potential Alien Invasive Plant Species within the study area

Family	Species and Genus
PHYTOLACCACEAE	*Phytolacca dioica*
VERBENACEAE	*Verbena brasiliensis*
FABACEAE	*Dalbergia sissoo*

MALVACEAE	*Malvastrum coromandelianum*
SOLANACEAE	*Nierembergia hippomanica*
PLUMBAGINACEAE	*Plumbago zeylanica*

8 SITE SENSITIVITY

8.1 Conservation and Spatial Planning Tools

Several conservation planning tools are available for the study areas. These tools allow for the potential identification of any sensitive and important areas from a vegetation perspective at the early stage of a proposed development/activity and allow for the fine-tuning of plans and footprints.

The following tools were identified and are discussed below:

- NEMBA Threatened Ecosystems
- North West Critical Biodiversity Areas

These tools together with the field survey have been used to assess the sensitivity of the study area. Sensitivity of the proposed prospecting application area as well as the surrounding environment is shown on a sensitivity map (Figure 8.1 below).

8.2 NEMBA Threatened Ecosystems

NEMBA provides a list of threatened terrestrial ecosystems. This was established as little attention has historically been paid to the protection of ecosystems outside of protected areas. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems.

The proposed application area is classified as **LEAST THREATENED** by NEMBA.

8.3 North West Critical Biodiversity Areas

The North West Conservation Plan has classified portions the application area as a CBA 2 and ESA 1. The site visit has confirmed that although large areas are transformed by human activities (predominantly communal livestock farming and overgrazing), some portions of the application area sections are still relatively intact and mostly natural.

Based on the site assessment, areas which fall within the CBA 2 and ESA 1 are allocated a **MEDIUM** sensitivity (Figure 8.1) while areas outside of the CBA 2 and ESA 1 are allocated a **LOW** sensitivity.

8.4 Vegetation

Majority of the prospecting application area falls within the Madikwe Dolomite Bushveld, with a small portion falling within the Dwaalboom Thornveld of the Savanna Biome.

SANBI classifies the Madikwe Dolomite Bushveld as well as the Dwaalboom Thornveld as **LEAST THREATENED**. However the North West Biodiversity Sector Plan (NWBSP) (2015) uses the results from an assessment of the provincial land cover by Desmet and Schaller (2015), which categorises the Dwaalboom Thornveld as **VULNERABLE.**

The targets (or thresholds) for defining threatened ecosystems follows the national guidelines (SANBI, 2014) and is based on the amount of each ecosystem (vegetation type) remaining relative to the biodiversity target. Based on this, the Dwaalboom Thornveld is classified as having less than 60% remaining of the vegetation type (60% is the ecological process target for all ecosystems).

Therefore, areas of the application area which fall within the Dwaalboom Thornveld are allocated a **MEDIUM** sensitivity, whereas areas within the Madikwe Dolomite Bushveld are allocated a **LOW** sensitivity.

In addition, the location of the plant SCC's observed on site have been allocated a **HIGH** sensitivity rating.

8.5 NFEPA Wetlands and Rivers

There are 4 NFEPA wetlands located within the application area. In addition, a number of non-perennial tributaries (drainage lines) traverse the application area in a south easterly direction at various locations.

All surface water features identified are allocated a **HIGH** sensitivity rating. In particular, the NFEPA wetlands and non-perennial tributaries have been allocated a **HIGH** sensitivity rating, whereas their respective 500 m and 100 m buffers have been allocated a **MEDIUM** sensitivity.

8.6 Eskom Servitude

The existing Eskom servitude which travels through the application area has been assigned a **MEDIUM** sensitivity.

8.7 Sensitivity map

A sensitivity map was developed based on the allocations made above, for the entire application area (Figure 8.1).

The proposed prospecting activities will largely fall within the area classified as having a MEDIUM sensitivity rating. Of the 10 036 hectare application area, the development footprint will be 1.65 hectares, therefore having a small impact within the larger application area. Refer to Section 8.8 below for recommendations and mitigations made regarding activities undertaken within the rated sensitive areas defined in Figure 8.1 below.

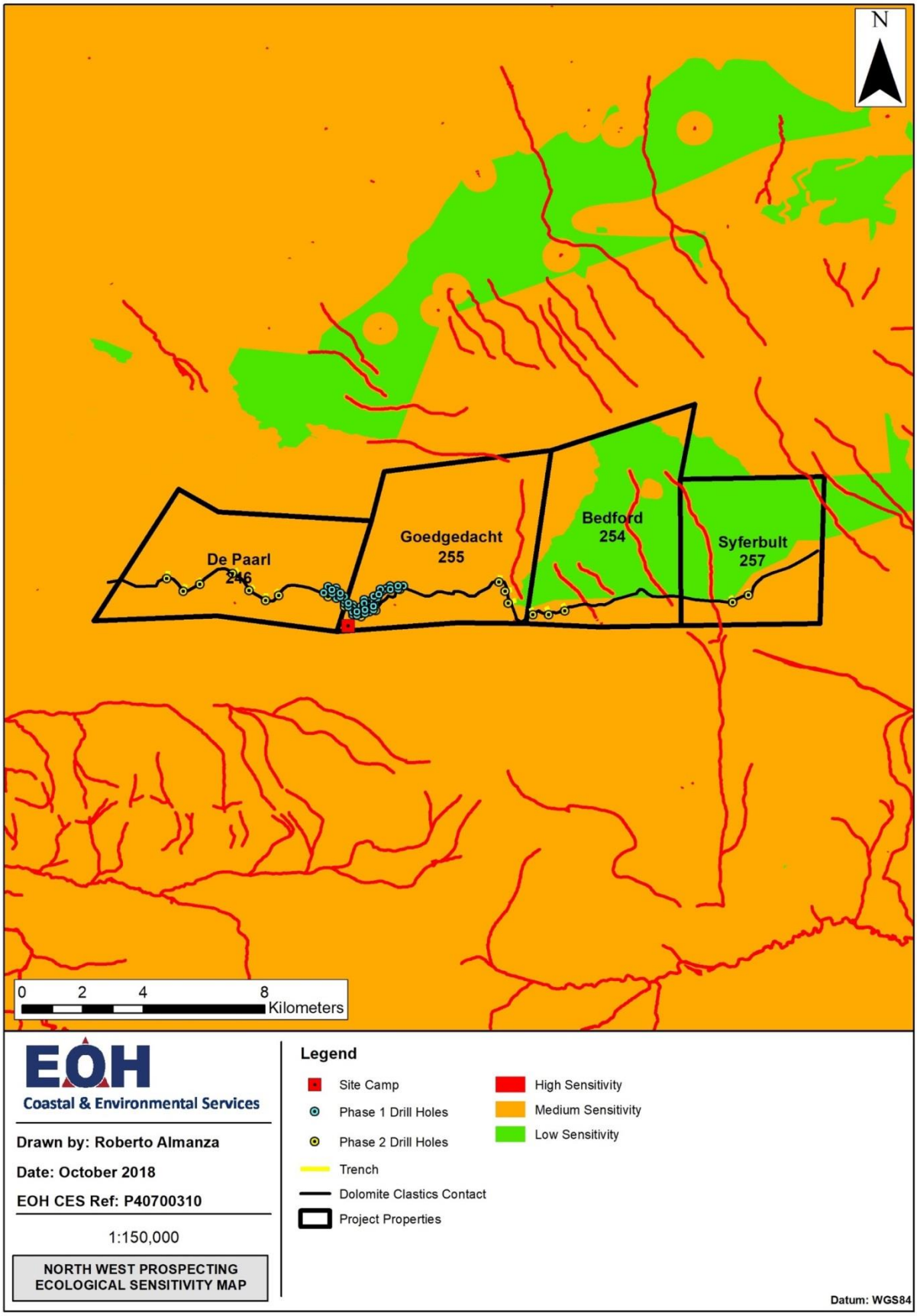

Figure 8.1: Sensitivity map for the proposed application area.

8.8 Recommendations

Various mitigations are recommended (based on the level of sensitivity of the affected area) to reduce the impacts of the proposed prospecting on the surrounding natural environment.

8.8.1 High sensitivity areas

All surface waterbodies are classified as **HIGH** sensitive areas (red areas in Figure 8.1) this includes dams, wetlands, drainage systems, rivers & streams. These areas (including a 500 m buffer around wetlands and 100m around other waterbodies) will require authorisation from the Department of Water & Sanitation (DWS) prior to commencement of activities should the proposed prospecting activities encroach on these buffer areas.

Floral SCC observed on site, namely *Aloe marlothii*, are classified as **HIGH** sensitive areas and should be avoided. If unavoidable, the relevant permits must be applied for prior to commencement of activities. It is likely that unidentified floral SCC are scattered throughout the application area. Therefore, it is recommended that a walkthrough of the areas to be prospected (including the site camp) be undertaking by a suitably qualified individual prior to the commencement of prospecting in order to ensure that no floral SCC are damaged or destroyed during prospecting activities, and to take into account possible seasonality changes. This walkthrough should ideally be undertaken with the appointed contractor/geologist during the demarcation of the prospecting sites. Should additional floral SCC be encountered, the relevant vegetation permits must also be applied for.

8.8.2 Medium sensitivity areas

Areas of the application area which fall within the Dwaalboom Thornveld are allocated a **MEDIUM** sensitivity, and vegetation clearing should be strictly monitored for unnecessary clearing.

In addition, all mitigation measures proposed must be adhered to ensure minimal disturbance within areas of the application area which fall within a CBA 2 and ESA 1.

Wetland and drainage channel buffers (500 m and 100 m respectively) have been allocated a **MEDIUM** sensitivity, and should be avoided.

In addition, activities within the Eskom servitude must adhere to the environmental conditions relating to the Eskom servitude.

8.8.3 Low sensitivity areas

These areas are considered as disturbed or transformed by human activities, including existing infrastructure development, livestock farming and overgrazing. These areas are suitable for development but may have some SCC present. An S&R exercise will not be required but any SCC observed during prospecting must be reported to the appointed ECO.

8.9 Issues identified

The following issues were identified during the sensitivity assessment of the proposed prospecting project (Table 8.1 below).

Table 8.1: Issues identified during the sensitivity assessment of the proposed application area.

ISSUES IDENTIFIED	DESCRIPTION OF IMPACTS
Loss of natural veld	The clearing of natural vegetation will lead to the permanent loss of natural bush and/or thornveld.
Loss of SCC	The clearing of natural vegetation may lead to the destruction of habitats and the loss of identified and unidentified floral SCC.
Loss of aquatic habitats	Encroachment of prospecting activities within wetlands, rivers and/or drainage channels will lead to the damage and loss of aquatic habitats and features.
Control of alien plant species	The clearing of natural vegetation creates 'open' habitats that will favour the establishment of undesirable alien plant species in areas that are typically very difficult to eradicate and may pose a threat to neighbouring natural ecosystems.
	The lack of an effective alien vegetation management plan may lead to the large scale alien plant invasion.
Rehabilitation of disturbed areas	Poor rehabilitation of disturbed areas may lead to the permanent degradation of ecosystems as well as allow invading alien vegetation species to expand.

9 MANNER IN WHICH THE ENVIRONMENT MAY BE AFFECTED

9.1 Impacts identified

The proposed project will entail a one (1) year non-invasive geophysical survey period (Phase 1) and a four (4) year invasive drilling period (Phase 2 & 3). Phase 2 (24 months) will consist of approximately 20 drill holes approximately 200 m deep, soil geochemical survey (approximately 5000 samples) and trenching (approximately 4000 m). Phase 3 (24 months) will consist of approximately 50 drill holes 200 m deep.

Based on the proposed project phases above, Table 9.1 below lists the potential impacts identified for the invasive Phase 2 and Phase 3 of the project.

Table 9.1. Impacts identified during all phases of the proposed prospecting activities.

Phases	Issue	Description of Impact
Planning & Design	Loss of natural bush and/or thornveld	Unnecessary vegetation clearing will lead to the permanent loss of natural bush and/or thornveld.
	Loss of SCC	Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of habitats and the loss of identified and unidentified floral SCC.
	Loss of aquatic habitats	Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of aquatic habitats and features present of site.
	Control of alien plant species	Lack of adequate planning for the control of alien invasive plant species will lead to large scale alien plant invasion
	Rehabilitation of disturbed areas	Lack of adequate planning for rehabilitation of disturbed areas will lead to degradation and erosion of the surrounding natural environment.
Prospecting (Construction)	Loss of natural bush and/or thornveld	During prospecting, the unnecessary clearing of natural vegetation will lead to the permanent loss of natural bush and/or thornveld.
	Loss of SCC	During prospecting, the unnecessary clearing of natural vegetation may lead to the destruction of habitats and the loss of identified and unidentified floral SCC.
	Loss of aquatic habitats	During prospecting, the encroachment of prospecting related activities into wetland and drainage channel areas may lead to the destruction and degradation of aquatic habitat and features.
	Control of alien plant species	During prospecting, the clearing of natural vegetation creates 'open' habitats that will favour the establishment of undesirable alien plant species in areas that are typically very difficult to eradicate and may pose a threat to neighbouring natural ecosystems.
	Rehabilitation	During prospecting, poor rehabilitation of disturbed

Phases	Issue	Description of Impact
	of disturbed areas	areas may lead to the permanent degradation of ecosystems as well as allow invading alien vegetation species to expand.
Closure	Control of alien plant species	During closure, the lack of an effective alien vegetation management plan may lead to the large scale alien plant invasion.
	Rehabilitation of disturbed areas	During closure, the lack of an effective rehabilitation plan may lead to the degradation and erosion of the surrounding natural environment.

9.2 Impact assessment

The impacts identified in Section 9.1 are assessed in terms of the criteria described in Section 3 and are summarised in the tables below (Table 9.2, 9.3 & 9.4)

Table 9.2. Assessment of impacts during the Planning & Design Phase

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBABILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
Loss of natural bush and/or thornveld												
Unnecessary vegetation clearing will lead to the permanent loss of natural bush and/or thornveld.	Negative	Direct, Indirect, cumulative	Localised	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Probable	High or Completely Mitigatable	MODERATE	LOW	• Ensure that the siting of drill sites, trenches, soil survey points, access routes and site camp is designed in such a way as to impact on the minimal possible area. This will ensure that impacts on natural vegetation are kept at a minimum.
Loss of SCC												
Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of habitats and the loss of identified and unidentified plant SCC.	Negative	Direct, indirect, cumulative	Localised	Long Term	HIGH NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• A walkthrough of the areas to be prospected (including the site camp) must be undertaken by a suitably qualified individual prior to the commencement of prospecting to identify possible floral SCC that may be present. • This walkthrough should ideally be undertaken with the appointed contractor/geologist during the demarcation of the prospecting sites. • Should floral SCC be found, these should be avoided. • Where unavoidable, the relevant permits must be obtained from the competent authority in order to remove any floral SCC.

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBABILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
Loss of aquatic habitats												
Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of aquatic habitats and features present of site.	Negative	Direct, indirect, cumulative	Localised	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• Ensure that the siting of drill sites, trenches, soil survey points, access routes and site camp are located outside of the recommended 500 m wetland and 100 m watercourse buffers. • Any activities within these buffer areas will require a Water Use License from the Department of Water and Sanitation (DWS).
Control of alien plant species												
Lack of adequate planning for the control of alien invasive plant species will lead to large scale alien plant invasion	Negative	Direct, indirect, cumulative	Project Level	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• During the planning and design phase, an Alien Invasive Plant Management Plan must be compiled detailing measures for the effective control of alien invasive species during prospecting and closure.
Rehabilitation of disturbed areas												
Lack of adequate planning for rehabilitation of disturbed areas will lead to degradation and erosion of the surrounding natural environment.	Negative	Direct, indirect, cumulative	Project Level	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Definite	High or Completely Mitigatable	MODERATE	LOW	• During the planning and design phase, a Rehabilitation and Erosion Management Plan must be compiled detailing measures for the rehabilitation of disturbed areas as soon as prospecting activities have been completed in each area.

Table 9.3. Assessment of impacts during Prospecting (Construction Phase)

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
Loss of natural bush and/or thornveld												
Unnecessary vegetation clearing will lead to the permanent loss of natural bush and/or thornveld.	Negative	Direct	Project Level	Short Term	HIGH NEGATIVE	Reversible	Resource may be partly destroyed	Definite	High or Completely Mitigatable	MODERATE	LOW	• The prospecting footprint must be surveyed and demarcated prior to prospecting activities commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved footprint. • Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken as soon as practically possible. • The contractor/applicant must monitor vegetation clearing on site.
Loss of SCC												
Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of habitats and the loss of identified and unidentified plant SCC.	Negative	Direct, indirect, cumulative	Localised	Long Term	HIGH NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• The Applicant must ensure that the contractor and staff are made aware of potential floral SCC on site, as identified during the initial walkthrough. • The prospecting footprint must avoid identified floral SCC as much as practically possible. • Where this is not possible the contractor/applicant

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
												must ensure that the relevant permits are obtained prior to destruction. • The contractor/applicant must monitor for the presence of floral SCC, and advise accordingly.
Loss of aquatic habitats												
Lack of adequate planning for the siting of proposed drill sites, trenches, soil surveying, access routes and site camp may lead to the destruction of aquatic habitats and features present of site.	Negative	Direct, indirect, cumulative	Localised	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Definite	High or Completely Mitigatable	MODERATE	LOW	• Aquatic features identified on site must be avoided. • The contractor and staff must be made aware of these "No-Go" areas. • The contractor/applicant must monitor for encroachment within these areas.
Control of alien plant species												
Lack of adequate planning for the control of alien invasive plant species will lead to large scale alien plant invasion	Negative	Direct, indirect, cumulative	Project Level	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• The Alien Vegetation Rehabilitation and Management Plan must be implemented. • The contractor/applicant must monitor for the establishment and spread of alien invasive species and advise accordingly.
Rehabilitation of disturbed areas												
Lack of adequate planning for rehabilitation of disturbed areas will lead to degradation and erosion of the	Negative	Direct, indirect, cumulative	Project Level	Short Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Definite	High or Completely Mitigatable	MODERATE	LOW	• All temporarily impacted areas must be rehabilitated back to their original condition. • Only topsoil from

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
surrounding natural environment.												the immediate area must be used for rehabilitation. • All temporarily impacted areas must be restored as per the Rehabilitation and Erosion Management Plan.

Table 9.4. Assessment of impacts during Closure

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
Control of alien plant species												
Lack of adequate planning for the control of alien invasive plant species will lead to large scale alien plant invasion	Negative	Direct, indirect, cumulative	Project Level	Medium Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Possible	High or Completely Mitigatable	MODERATE	LOW	• The Alien Vegetation Rehabilitation and Management Plan must be implemented. • The contractor/applicant must ensure adequate effort has been taken to reduce the spread of alien invasive species at closure.
Rehabilitation of disturbed areas												
Lack of adequate planning for rehabilitation of disturbed areas will lead to degradation and erosion of the surrounding natural environment.	Negative	Direct, indirect, cumulative	Project Level	Medium Term	MEDIUM NEGATIVE	Reversible	Resource may be partly destroyed	Definite	High or Completely Mitigatable	MODERATE	LOW	• All temporarily impacted areas must be rehabilitated back to their original condition. • Only topsoil from the immediate area must be used for rehabilitation. • All temporarily impacted areas must be restored as per the

POTENTIAL IMPACTS	OVERALL NATURE	TYPE	SPATIAL EXTENT	DURATION	SEVERITY	REVERSIBILITY	IRREPLACABLE LOSS	PROBBILITY	MITIGATION POTENTIAL	SIGNIFICANCE		MITIGATION MEASURES
										Without Mitigation	With Mitigation	
												Rehabilitation and Erosion Management Plan. • A suitably qualified individual/botanist should conduct a closure audit to ensure rehabilitation has been undertaken in a satisfactory manner.

10 IMPACT STATEMENT, CONCLUSION AND RECOMMENDATIONS

10.1 Conclusions

The following table summarises the change in impacts from pre- to post- mitigation for the proposed prospecting project.

Table 10.1. Assessment of pre- and post-mitigation impact significance.

Project Phases	PRE-MITIGATION			POST-MITIGATION		
	LOW	MODERATE	HIGH	LOW	MODERATE	HIGH
Planning and Design	0	5	0	5	0	0
Prospecting (Construction)	0	5	0	5	0	0
Closure	0	2	0	2	0	0
TOTAL	0	12	0	12	0	0

10.2 Current status

A total of 18 potential floral and 4 faunal SCC were identified to likely occur within the application area (a detailed list is provided in Appendix 2). One floral SCC, namely the *Aloe marlothii*, was identified on site.

The majority of the prospecting application area falls within the Madikwe Dolomite Bushveld, with a small portion falling within the Dwaalboom Thornveld of the Savanna Biome. The Dwaalboom Thornveld has been classified as **VULNERABLE** by Desmet and Schaller (2015) as per the North West Biodiversity Sector Plan (2016). SANBI classifies both vegetation types as **LEAST THREATENED.**

Only one alien invasive plant species was observed on site, namely *Opuntia ficus-indica* (Prickly Pear), which was noted alongside the road which passes through De Paarl Farm. As the study area was noticeably dry, this may have an impact on the presence of alien invasive species in the area. Therefore, an Alien Invasive Plant Management Plan must be compiled and implemented during the prospecting and closure phase of the project, and that active management of identified and unidentified alien species listed as Category 1b are controlled.

There are 4 NFEPA wetlands located within the application area. In addition to the above, a number of non-perennial tributaries (drainage lines) traverse the application area in a south easterly direction at various locations. No prospecting activities are proposed to take place within the recommended buffer areas of the wetland and tributaries noted on site.

10.3 Alternatives

No alternatives were assessed. The proposed drills sites, trenches, soil surveys, and site camp occur outside of any wetland or drainage channel buffer areas, therefore no alternative locations within the application area for these activities have been recommended.

10.4 Mitigation measures

The following mitigation measures must be included in the final Environmental Management Programme (EMPr) for the proposed prospecting project. The section below details the mitigation measures recommended for each of the project phases, namely design and planning, prospecting (construction), and closure phase.

10.4.1 Planning & Design phase

- Ensure that the siting of drill sites, trenches, soil survey points, access routes and site camp is designed in such a way as to impact on the minimal possible area. This will ensure that impacts on natural vegetation are kept at a minimum.
- A walkthrough of the areas to be prospected (including the site camp) must be undertaken by a suitably qualified individual prior to the commencement of prospecting to identify possible floral SCC that may be present.
- This walkthrough should ideally be undertaken with the appointed contractor/geologist during the demarcation of the prospecting sites.
- Should floral SCC be found, these should be avoided.
- Where unavoidable, the relevant permits must be obtained from the competent authority in order to remove any floral SCC.
- Ensure that the siting of drill sites, trenches, soil survey points, access routes and site camp are located outside of the recommended 500 m wetland and 100 m watercourse buffers.
- Any activities within these buffer areas will require a Water Use License from the Department of Water and Sanitation (DWS).
- During the planning and design phase, an Alien Invasive Plant Management Plan must be compiled detailing measures for the effective control of alien invasive species during prospecting and closure.
- During the planning and design phase, a Rehabilitation and Erosion Management Plan must be compiled detailing measures for the rehabilitation of disturbed areas as soon as prospecting activities have been completed in each area.

10.4.2 Construction phase

- The prospecting footprint must be surveyed and demarcated prior to prospecting activities commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved footprint.
- Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken as soon as practically possible.
- Thecontractor/applicant must monitor vegetation clearing on site.
- The Applicant must ensure that the contractor and staff are made aware of potential floral SCC on site, as identified during the initial walkthrough.
- The prospecting footprint must avoid identified floral SCC as much as practically possible. Where this is not possible, the contractor/applicant must ensure that the relevant permits are obtained prior to destruction.
- An contractor/applicant must monitor for the presence of floral SCC, and advise accordingly.
- Aquatic features identified on site must be avoided.
- The contractor and staff must be made aware of these “No-Go” areas.
- The contractor/applicant must monitor for encroachment within these areas.

- The Alien Vegetation Rehabilitation and Management Plan must be implemented.
- The contractor/applicant must monitor for the establishment and spread of alien invasive species and advise accordingly.
- All temporarily impacted areas must be rehabilitated back to their original condition.
- Only topsoil from the immediate area must be used for rehabilitation.
- All temporarily impacted areas must be restored as per the Rehabilitation and Erosion Management Plan.

10.4.3 Closure phase

- The Alien Vegetation Rehabilitation and Management Plan must be implemented.
- The contractor/applicant must ensure adequate effort has been taken to reduce the spread of alien invasive species at closure.
- All temporarily impacted areas must be rehabilitated back to their original condition.
- Only topsoil from the immediate area must be used for rehabilitation.
- All temporarily impacted areas must be restored as per the Rehabilitation and Erosion Management Plan.
- A suitably qualified individual/botanist should conduct a closure audit to ensure rehabilitation has been undertaken in a satisfactory manner.

10.5 Environmental Statement and Opinion of the Specialist

The ecological impacts of all aspects for the proposed prospecting project were assessed and considered to be ecologically acceptable, provided that the mitigation measures provided in this report are implemented. All impacts are rated as **MODERATE** to **HIGH** pre-mitigation (Table 9.1), therefore implementation of recommended mitigation measures coupled with comprehensive rehabilitation and monitoring in terms of re-vegetation and restoration is an important element of the mitigation strategy. Implementing the recommended mitigations measures will reduce all impacts to **LOW**.

None of the proposed drill sites, trenches, soil surveys, and site camp locations are considered to be **Fatally Flawed**. This is largely due to the proposed sites surveyed during the site visit being largely absent of any identified floral SCC (except for *Aloe marlothii*) (the recommended walkthrough by a suitably qualified individual prior to prospecting will take into account possible floral SCC not encountered during the initial site visit). In addition, the proposed prospecting sites located outside of the recommended aquatic buffers. In addition, although a portion of the application area falls within a CBA 2 and ESA1, the site is largely overgrazed as it is mainly used as communal grazing land.

The **No-Go option** refers to the prospecting not taking place. This option will therefore have no impact (positive or negative) on the local vegetation and biodiversity if it is not implemented.

The local area is largely rural with sparse urban clusters and roads occurring. The application area has been transformed and degraded due to livestock farming and overgrazing. Prospecting activities within the proposed application area are therefore expected to have a **negligent cumulative impact** on the surrounding environment, provided that all mitigation measures proposed is implemented.

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APPENDIX A
VEGETATION LIST

The detailed list of floral species likely to be found within North West Province:

Family	Genus	Species	Threat status	Family	Genus	Species	Threat status
Cyperaceae	*Abildgaardia*	*ovata*	LC (POSA)	Poaceae	*Heteropogon*	*contortus*	LC (POSA)
Malvaceae	*Abutilon*	*austro-africanum*	LC (POSA)	Malvaceae	*Hibiscus*	*pusillus*	LC (POSA)
Euphorbiaceae	*Acalypha*	*angustata*	LC (POSA)	Malvaceae	*Hibiscus*	*microcarpus*	LC (POSA)
Euphorbiaceae	*Acalypha*	*villicaulis*	LC (POSA)	Malvaceae	*Hibiscus*	*calyphyllus*	LC (POSA)
Apocynaceae	*Acokanthera*	*oppositifolia*	LC (POSA)	Asteraceae	*Hilliardiella*	*elaeagnoides*	LC (POSA)
Pteridaceae	*Actiniopteris*	*radiata*	LC (POSA)	Asteraceae	*Hirpicium*	*bechuanense*	LC (POSA)
Amaranthaceae	*Aerva*	*leucura*	LC (POSA)	Poaceae	*Hyparrhenia*	*poecilotricha*	LC (POSA)
Rubiaceae	*Agathisanthemum*	*bojeri*	LC (POSA)	Poaceae	*Hyparrhenia*	*anamesa*	LC (POSA)
Loranthaceae	*Agelanthus*	*natalitius*	LC (POSA)	Poaceae	*Hyparrhenia*	*quarrei*	LC (POSA)
Hyacinthaceae	*Albuca*	*seineri*	LC (POSA)	Poaceae	*Hyparrhenia*	*hirta*	LC (POSA)
Poaceae	*Alloteropsis*	*semialata*	LC (POSA)	Poaceae	*Hyparrhenia*	*tamba*	LC (POSA)
ASPHODELACEAE	***Aloe***	***peglerae***	**EN (IUCN)**	Poaceae	*Hyparrhenia*	*filipendula*	LC (POSA)
Fabaceae	*Alysicarpus*	*zeyheri*	LC (POSA)	Hypericaceae	*Hypericum*	*aethiopicum*	LC (POSA)
PORTULACACEAE	***Anacampseros***	***decapitata***	**VU (IUCN)**	Poaceae	*Hyperthelia*	*dissoluta*	LC (POSA)
Poaceae	*Andropogon*	*chinensis*	LC (POSA)	Acanthaceae	*Hypoestes*	*forskaolii*	LC (POSA)
Poaceae	*Anthephora*	*pubescens*	LC (POSA)	Hypoxidaceae	*Hypoxis*	*angustifolia*	LC (POSA)
Rubiaceae	*Anthospermum*	*rigidum*	LC (POSA)	Fabaceae	*Indigofera*	*heterotricha*	LC (POSA)
Icacinaceae	*Apodytes*	*dimidiata*	LC (POSA)	Fabaceae	*Indigofera*	*daleoides*	LC (POSA)
Scrophulariaceae	*Aptosimum*	*elongatum*	LC (POSA)	Fabaceae	*Indigofera*	*torulosa*	LC (POSA)
Poaceae	*Aristida*	*diffusa*	LC (POSA)	Fabaceae	*Indigofera*	*hedyantha*	LC (POSA)
Poaceae	*Aristida*	*adscensionis*	LC (POSA)	Fabaceae	*Indigofera*	*holubii*	LC (POSA)

Poaceae	*Aristida*	*congesta*	LC (POSA)	Convolvulaceae	*Ipomoea*	*crassipes*	LC (POSA)
Apocynaceae	*Asclepias*	*aurea*	LC (POSA)	Convolvulaceae	*Ipomoea*	*obscura*	LC (POSA)
Apocynaceae	*Asclepias*	*gibba*	LC (POSA)	Convolvulaceae	*Ipomoea*	*bolusiana*	LC (POSA)
Asparagaceae	*Asparagus*	*cooperi*	LC (POSA)	Poaceae	*Ischaemum*	*fasciculatum*	LC (POSA)
Asparagaceae	*Asparagus*	*virgatus*	LC (POSA)	Scrophulariaceae	*Jamesbrittenia*	*aurantiaca*	LC (POSA)
Aspleniaceae	*Asplenium*	*aethiopicum*	LC (POSA)	Scrophulariaceae	*Jamesbrittenia*	*burkeana*	LC (POSA)
Aspleniaceae	*Asplenium*	*phillipsianum*	LC (POSA)	Oleaceae	*Jasminum*	*breviflorum*	LC (POSA)
Acanthaceae	*Barleria*	*bremekampii*	LC (POSA)	Euphorbiaceae	*Jatropha*	*schlechteri*	LC (POSA)
Fabaceae	*Bauhinia*	*galpinii*	LC (POSA)	Acanthaceae	*Justicia*	*betonica*	LC (POSA)
Rhamnaceae	*Berchemia*	*zeyheri*	LC (POSA)	Acanthaceae	*Justicia*	*odora*	LC (POSA)
Elatinaceae	*Bergia*	*decumbens*	LC (POSA)	Acanthaceae	*Justicia*	*flava*	LC (POSA)
Poaceae	*Bewsia*	*biflora*	LC (POSA)	Crassulaceae	*Kalanchoe*	*lanceolata*	LC (POSA)
Acanthaceae	*Blepharis*	*subvolubilis*	LC (POSA)	Crassulaceae	*Kalanchoe*	*rotundifolia*	LC (POSA)
Acanthaceae	*Blepharis*	*serrulata*	LC (POSA)	Cyperaceae	*Kyllinga*	*alba*	LC (POSA)
Capparaceae	*Boscia*	*foetida*	LC (POSA)	Cyperaceae	*Kyllinga*	*erecta*	LC (POSA)
Capparaceae	*Boscia*	*albitrunca*	LC (POSA)	Amaranthaceae	*Kyphocarpa*	*angustifolia*	LC (POSA)
Poaceae	*Bothriochloa*	*radicans*	LC (POSA)	Asteraceae	*Laggera*	*crispata*	LC (POSA)
Poaceae	*Bothriochloa*	*insculpta*	LC (POSA)	Anacardiaceae	*Lannea*	*discolor*	LC (POSA)
Poaceae	*Brachiaria*	*deflexa*	LC (POSA)	Verbenaceae	*Lantana*	*rugosa*	LC (POSA)
Poaceae	*Brachiaria*	*brizantha*	LC (POSA)	Thymelaeaceae	*Lasiosiphon*	*microcephalus*	LC (POSA)
Poaceae	*Brachiaria*	*serrata*	LC (POSA)	Thymelaeaceae	*Lasiosiphon*	*sericocephalus*	LC (POSA)
Poaceae	*Brachiaria*	*nigropedata*	LC (POSA)	Thymelaeaceae	*Lasiosiphon*	*capitatus*	LC (POSA)
Bryaceae	*Brachymenium*	*acuminatum*	LC (POSA)	Fabaceae	*Leobordea*	*divaricata*	LC (POSA)
Phyllanthaceae	*Bridelia*	*mollis*	LC (POSA)	Lamiaceae	*Leonotis*	*schinzii*	LC (POSA)
Bryaceae	*Bryum*	*pycnophyllum*	LC (POSA)	Limeaceae	*Limeum*	*viscosum*	LC (POSA)
Bryaceae	*Bryum*	*argenteum*	LC (POSA)	Poaceae	*Loudetia*	*flavida*	LC (POSA)
Scrophulariaceae	*Buddleja*	*saligna*	LC (POSA)	Solanaceae	*Lycium*	*horridum*	LC (POSA)
Cyperaceae	*Bulbostylis*	*burchellii*	LC (POSA)	Celastraceae	*Maytenus*	*undata*	LC (POSA)
Cyperaceae	*Bulbostylis*	*scabricaulis*	LC (POSA)	Malvaceae	*Melhania*	*acuminata*	LC (POSA)

Cyperaceae	*Bulbostylis*	*humilis*	LC (POSA)	Poaceae	*Melinis*	*nerviglumis*	LC (POSA)
Capparaceae	*Cadaba*	*termitaria*	LC (POSA)	Poaceae	*Melinis*	*repens*	LC (POSA)
Rutaceae	*Calodendrum*	*capense*	LC (POSA)	Oleaceae	*Menodora*	*heterophylla*	LC (POSA)
Cyperaceae	*Carex*	*uhligii*	LC (POSA)	Convolvulaceae	*Merremia*	*palmata*	LC (POSA)
Apocynaceae	*Carissa*	*bispinosa*	LC (POSA)	Poaceae	*Microchloa*	*caffra*	LC (POSA)
Poaceae	*Cenchrus*	*ciliaris*	LC (POSA)	Sapotaceae	*Mimusops*	*zeyheri*	LC (POSA)
Dipsacaceae	*Cephalaria*	*zeyheriana*	LC (POSA)	Geraniaceae	*Monsonia*	*angustifolia*	LC (POSA)
Cannabaceae	*Chaetachme*	*aristata*	LC (POSA)	Fabaceae	*Mundulea*	*sericea*	LC (POSA)
Fabaceae	*Chamaecrista*	*biensis*	LC (POSA)	Myrothamnaceae	*Myrothamnus*	*flabellifolius*	LC (POSA)
Fabaceae	*Chamaecrista*	*comosa*	LC (POSA)	Fabaceae	*Neorautanenia*	*ficifolia*	LC (POSA)
Verbenaceae	*Chascanum*	*hederaceum*	LC (POSA)	Asteraceae	*Nidorella*	*hottentotica*	LC (POSA)
Pteridaceae	*Cheilanthes*	*viridis*	LC (POSA)	Asteraceae	*Nidorella*	*resedifolia*	LC (POSA)
Pteridaceae	*Cheilanthes*	*hirta*	LC (POSA)	Stilbaceae	*Nuxia*	*congesta*	LC (POSA)
Gentianaceae	*Chironia*	*palustris*	LC (POSA)	Ochnaceae	*Ochna*	*inermis*	LC (POSA)
Poaceae	*Chloris*	*virgata*	LC (POSA)	Lamiaceae	*Ocimum*	*gratissimum*	LC (POSA)
Agavaceae	*Chlorophytum*	*recurvifolium*	LC (POSA)	Oleaceae	*Olea*	*europaea*	LC (POSA)
Poaceae	*Chrysopogon*	*serrulatus*	LC (POSA)	Lamiaceae	*Orthosiphon*	*suffrutescens*	LC (POSA)
Ranunculaceae	*Clematis*	*brachiata*	LC (POSA)	Santalaceae	*Osyris*	*lanceolata*	LC (POSA)
Cleomaceae	*Cleome*	*monophylla*	LC (POSA)	Oxalidaceae	*Oxalis*	*depressa*	LC (POSA)
Euphorbiaceae	*Clutia*	*cordata*	LC (POSA)	Oxalidaceae	*Oxalis*	*smithiana*	LC (POSA)
Euphorbiaceae	*Clutia*	*pulchella*	LC (POSA)	Anacardiaceae	*Ozoroa*	*paniculosa*	LC (POSA)
Combretaceae	*Combretum*	*hereroense*	LC (POSA)	Poaceae	*Panicum*	*maximum*	LC (POSA)
Combretaceae	*Combretum*	*imberbe*	LC (POSA)	Poaceae	*Panicum*	*deustum*	LC (POSA)
Combretaceae	*Combretum*	*molle*	LC (POSA)	Poaceae	*Panicum*	*volutans*	LC (POSA)
Combretaceae	*Combretum*	*apiculatum*	LC (POSA)	Poaceae	*Panicum*	*coloratum*	LC (POSA)
Combretaceae	*Combretum*	*zeyheri*	LC (POSA)	Sapindaceae	*Pappea*	*capensis*	LC (POSA)
Commelinaceae	*Commelina*	*africana*	LC (POSA)	Asteraceae	*Parapolydora*	*fastigiata*	LC (POSA)
Commelinaceae	*Commelina*	*livingstonii*	LC (POSA)	Poaceae	*Paspalum*	*scrobiculatum*	LC (POSA)
Commelinaceae	*Commelina*	*modesta*	LC (POSA)	Rubiaceae	*Pavetta*	*gardeniifolia*	LC (POSA)

Burseraceae	*Commiphora*	*schimperi*	LC (POSA)	Rubiaceae	*Pavetta*	*eylesii*	LC (POSA)
Burseraceae	*Commiphora*	*glandulosa*	LC (POSA)	Rubiaceae	*Pavetta*	*zeyheri*	LC (POSA)
Convolvulaceae	*Convolvulus*	*aschersonii*	LC (POSA)	Rubiaceae	*Pavetta*	*gardeniifolia*	LC (POSA)
Malvaceae	*Corchorus*	*asplenifolius*	LC (POSA)	Fabaceae	*Pearsonia*	*uniflora*	LC (POSA)
Acanthaceae	*Crabbea*	*angustifolia*	LC (POSA)	Pteridaceae	*Pellaea*	*calomelanos*	LC (POSA)
Crassulaceae	*Crassula*	*lanceolata*	LC (POSA)	Fabaceae	*Peltophorum*	*africanum*	LC (POSA)
Linderniaceae	*Craterostigma*	*plantagineum*	LC (POSA)	Rubiaceae	*Pentanisia*	*angustifolia*	LC (POSA)
Amaryllidaceae	*Crinum*	*paludosum*	LC (POSA)	Apocynaceae	*Periglossum*	*mackenii*	LC (POSA)
Fabaceae	*Crotalaria*	*virgulata*	LC (POSA)	FABACEAE	*Pearsonia*	*bracteata*	NT (IUCN)
Fabaceae	*Crotalaria*	*lotoides*	LC (POSA)	Phyllanthaceae	*Phyllanthus*	*incurvus*	LC (POSA)
Fabaceae	*Crotalaria*	*sphaerocarpa*	LC (POSA)	Poaceae	*Pogonarthria*	*squarrosa*	LC (POSA)
Euphorbiaceae	*Croton*	*gratissimus*	LC (POSA)	Polygalaceae	*Polygala*	*krumanina*	LC (POSA)
Euphorbiaceae	*Croton*	*gratissimus*	LC (POSA)	Polygalaceae	*Polygala*	*hottentotta*	LC (POSA)
Apocynaceae	*Cryptolepis*	*oblongifolia*	LC (POSA)	Polygalaceae	*Polygala*	*transvaalensis*	LC (POSA)
Cucurbitaceae	*Cucumis*	*hirsutus*	LC (POSA)	Polygalaceae	*Polygala*	*amatymbica*	LC (POSA)
Araliaceae	*Cussonia*	*transvaalensis*	LC (POSA)	Portulacaceae	*Portulaca*	*quadrifida*	LC (POSA)
Commelinaceae	*Cyanotis*	*speciosa*	LC (POSA)	Proteaceae	*Protea*	*caffra*	LC (POSA)
Poaceae	*Cymbopogon*	*pospischilii*	LC (POSA)	Asteraceae	*Pseudopegolettia*	*tenella*	LC (POSA)
Poaceae	*Cymbopogon*	*prolixus*	LC (POSA)	Apocynaceae	*Raphionacme*	*galpinii*	LC (POSA)
Poaceae	*Cynodon*	*dactylon*	LC (POSA)	Vitaceae	*Rhoicissus*	*tridentata*	LC (POSA)
Cyperaceae	*Cyperus*	*austro-africanus*	LC (POSA)	Fabaceae	*Rhynchosia*	*densiflora*	LC (POSA)
Cyperaceae	*Cyperus*	*albostriatus*	LC (POSA)	Fabaceae	*Rhynchosia*	*minima*	LC (POSA)
Cyperaceae	*Cyperus*	*rupestris*	LC (POSA)	Fabaceae	*Rhynchosia*	*minima*	LC (POSA)
Cyperaceae	*Cyperus*	*uitenhagensis*	LC (POSA)	Fabaceae	*Rhynchosia*	*atropurpurea*	LC (POSA)
Cyperaceae	*Cyperus*	*cuspidatus*	LC (POSA)	Fabaceae	*Rhynchosia*	*holosericea*	LC (POSA)
Cyperaceae	*Cyperus*	*decurvatus*	LC (POSA)	Fabaceae	*Rhynchosia*	*totta*	LC (POSA)
Cyperaceae	*Cyperus*	*kyllingiella*	LC (POSA)	Fabaceae	*Rhynchosia*	*albissima*	LC (POSA)
Cyperaceae	*Cyperus*	*indecorus*	LC (POSA)	Ricciaceae	*Riccia*	*okahandjana*	LC (POSA)
Cyperaceae	*Cyperus*	*denudatus*	LC (POSA)	Ricciaceae	*Riccia*	*atropurpurea*	LC (POSA)

Lobeliaceae	*Cyphia*	*assimilis*	LC (POSA)	Ricciaceae	*Riccia*	*volkii*	LC (POSA)
Vitaceae	*Cyphostemma*	*simulans*	LC (POSA)	Lamiaceae	*Rotheca*	*louwalbertsii*	LC (POSA)
Vitaceae	*Cyphostemma*	*lanigerum*	LC (POSA)	Rubiaceae	*Rothmannia*	*capensis*	LC (POSA)
Caryophyllaceae	*Dianthus*	*mooiensis*	LC (POSA)	Lamiaceae	*Salvia*	*runcinata*	LC (POSA)
Caryophyllaceae	*Dianthus*	*zeyheri*	LC (POSA)	Ruscaceae	*Sansevieria*	*aethiopica*	LC (POSA)
Pedaliaceae	*Dicerocaryum*	*senecioides*	LC (POSA)	Amaryllidaceae	*Scadoxus*	*puniceus*	LC (POSA)
Poaceae	*Dichanthium*	*annulatum*	LC (POSA)	Poaceae	*Schizachyrium*	*sanguineum*	LC (POSA)
Asteraceae	*Dicoma*	*anomala*	LC (POSA)	Hyacinthaceae	*Schizocarphus*	*nervosus*	LC (POSA)
Poaceae	*Digitaria*	*argyrograpta*	LC (POSA)	Cyperaceae	*Schoenoplectus*	*muriculatus*	LC (POSA)
Poaceae	*Digitaria*	*eriantha*	LC (POSA)	Cyperaceae	*Schoenoplectus*	*muricinux*	LC (POSA)
Poaceae	*Diheteropogon*	*amplectens*	LC (POSA)	Anacardiaceae	*Searsia*	*pyroides*	LC (POSA)
DIOSCOREACEAE	***Dioscorea***	***sylvatica***	**VU (IUCN)**	Anacardiaceae	*Searsia*	*dentata*	LC (POSA)
Ebenaceae	*Diospyros*	*lycioides*	LC (POSA)	Anacardiaceae	*Searsia*	*leptodictya*	LC (POSA)
Ebenaceae	*Diospyros*	*whyteana*	LC (POSA)	Anacardiaceae	*Searsia*	*magalismontana*	LC (POSA)
Asteraceae	*Doellia*	*cafra*	LC (POSA)	Apocynaceae	*Secamone*	*filiformis*	LC (POSA)
Pteridaceae	*Doryopteris*	*concolor*	LC (POSA)	Scrophulariaceae	*Selago*	*lacunosa*	LC (POSA)
Salicaceae	*Dovyalis*	*zeyheri*	LC (POSA)	Asteraceae	*Senecio*	*affinis*	LC (POSA)
Hyacinthaceae	*Drimia*	*altissima*	LC (POSA)	Asteraceae	*Senecio*	*barbertonicus*	LC (POSA)
Hyacinthaceae	*Drimia*	*uniflora*	LC (POSA)	Poaceae	*Setaria*	*nigrirostris*	LC (POSA)
Boraginaceae	*Ehretia*	*rigida*	LC (POSA)	Poaceae	*Setaria*	*sphacelata*	LC (POSA)
Cyperaceae	*Eleocharis*	*limosa*	LC (POSA)	Poaceae	*Setaria*	*lindenbergiana*	LC (POSA)
Poaceae	*Elionurus*	*muticus*	LC (POSA)	Malvaceae	*Sida*	*cordifolia*	LC (POSA)
Poaceae	*Enneapogon*	*scoparius*	LC (POSA)	Malvaceae	*Sida*	*chrysantha*	LC (POSA)
Poaceae	*Enteropogon*	*macrostachyus*	LC (POSA)	Malvaceae	*Sida*	*dregei*	LC (POSA)
Poaceae	*Eragrostis*	*curvula*	LC (POSA)	Solanaceae	*Solanum*	*campylacanthum*	LC (POSA)
Poaceae	*Eragrostis*	*rigidior*	LC (POSA)	Poaceae	*Sorghum*	*bicolor*	LC (POSA)
Poaceae	*Eragrostis*	*barbinodis*	LC (POSA)	Malpighiaceae	*Sphedamnocarpus*	*pruriens*	LC (POSA)
Poaceae	*Eragrostis*	*rotifer*	LC (POSA)	Fabaceae	*Sphenostylis*	*angustifolia*	LC (POSA)

Poaceae	*Eragrostis*	*cilianensis*	LC (POSA)	Poaceae	*Sporobolus*	*fimbriatus*	LC (POSA)
Poaceae	*Eragrostis*	*capensis*	LC (POSA)	Poaceae	*Sporobolus*	*festivus*	LC (POSA)
Poaceae	*Eragrostis*	*lappula*	LC (POSA)	Poaceae	*Sporobolus*	*stapfianus*	LC (POSA)
Poaceae	*Eragrostis*	*chloromelas*	LC (POSA)	Apocynaceae	*Stenostelma*	*corniculatum*	LC (POSA)
Poaceae	*Eragrostis*	*inamoena*	LC (POSA)	Apocynaceae	*Stomatostemma*	*monteiroae*	LC (POSA)
Poaceae	*Eragrostis*	*patentipilosa*	LC (POSA)	Orobanchaceae	*Striga*	*bilabiata*	LC (POSA)
Poaceae	*Eragrostis*	*planiculmis*	LC (POSA)	Orobanchaceae	*Striga*	*elegans*	LC (POSA)
Poaceae	*Eragrostis*	*superba*	LC (POSA)	Fabaceae	*Stylosanthes*	*fruticosa*	LC (POSA)
Fabaceae	*Eriosema*	*burkei*	LC (POSA)	Pottiaceae	*Syntrichia*	*laevipila*	LC (POSA)
Ruscaceae	*Eriospermum*	*porphyrovalve*	LC (POSA)	Anacampserotaceae	*Talinum*	*caffrum*	LC (POSA)
Erpodiaceae	*Erpodium*	*coronatum*	LC (POSA)	Fabaceae	*Tephrosia*	*multijuga*	LC (POSA)
Sapindaceae	*Erythrophysa*	*transvaalensis*	LC (POSA)	Fabaceae	*Tephrosia*	*purpurea*	LC (POSA)
Ebenaceae	*Euclea*	*natalensis*	LC (POSA)	Combretaceae	*Terminalia*	*sericea*	LC (POSA)
Ebenaceae	*Euclea*	*undulata*	LC (POSA)	Lamiaceae	*Teucrium*	*trifidum*	LC (POSA)
Ebenaceae	*Euclea*	*crispa*	LC (POSA)	Poaceae	*Themeda*	*triandra*	LC (POSA)
Orchidaceae	*Eulophia*	*hians*	LC (POSA)	Santalaceae	*Thesium*	*magalismontanum*	LC (POSA)
Euphorbiaceae	*Euphorbia*	*inaequilatera*	LC (POSA)	Santalaceae	*Thesium*	*costatum*	LC (POSA)
Euphorbiaceae	*Euphorbia*	*schinzii*	LC (POSA)	Santalaceae	*Thesium*	*utile*	LC (POSA)
Poaceae	*Eustachys*	*paspaloides*	LC (POSA)	Acanthaceae	*Thunbergia*	*atriplicifolia*	LC (POSA)
Convolvulaceae	*Evolvulus*	*alsinoides*	LC (POSA)	Acanthaceae	*Thunbergia*	*neglecta*	LC (POSA)
Fabroniaceae	*Fabronia*	*pilifera*	LC (POSA)	Poaceae	*Trachypogon*	*spicatus*	LC (POSA)
Proteaceae	*Faurea*	*saligna*	LC (POSA)	Poaceae	*Tragus*	*berteronianus*	LC (POSA)
Asteraceae	*Felicia*	*fascicularis*	LC (POSA)	Poaceae	*Tricholaena*	*monachne*	LC (POSA)
Moraceae	*Ficus*	*thonningii*	LC (POSA)	Poaceae	*Trichoneura*	*grandiglumis*	LC (POSA)
Cyperaceae	*Fimbristylis*	*complanata*	LC (POSA)	Pottiaceae	*Trichostomum*	*brachydontium*	LC (POSA)
Poaceae	*Fingerhuthia*	*africana*	LC (POSA)	Poaceae	*Tripogon*	*minimus*	LC (POSA)
Phyllanthaceae	*Flueggea*	*virosa*	LC (POSA)	Poaceae	*Tristachya*	*biseriata*	LC (POSA)

AIZOACEAE	***Frithia***	***pulchra***	**VU (IUCN)**	Malvaceae	*Triumfetta*	*sonderi*	LC (POSA)
Cyperaceae	*Fuirena*	*pubescens*	LC (POSA)	Cucurbitaceae	*Trochomeria*	*macrocarpa*	LC (POSA)
Asteraceae	*Geigeria*	*burkei*	LC (POSA)	Alliaceae	*Tulbaghia*	*leucantha*	LC (POSA)
Asteraceae	*Gerbera*	*ambigua*	LC (POSA)	Meliaceae	*Turraea*	*obtusifolia*	LC (POSA)
Iridaceae	*Gladiolus*	*sericeovillosus*	LC (POSA)	Fabaceae	*Tylosema*	*esculentum*	LC (POSA)
Asteraceae	*Gnaphalium*	*filagopsis*	LC (POSA)	Poaceae	*Urelytrum*	*agropyroides*	LC (POSA)
Thymelaeaceae	*Gnidia*	*sericocephala*	LC (POSA)	Poaceae	*Urochloa*	*mosambicensis*	LC (POSA)
Malvaceae	*Grewia*	*bicolor*	LC (POSA)	Fabaceae	*Vachellia*	*tortilis*	LC (POSA)
Malvaceae	*Grewia*	*hexamita*	LC (POSA)	Fabaceae	*Vachellia*	*karroo*	LC (POSA)
Malvaceae	*Grewia*	*monticola*	LC (POSA)	Vahliaceae	*Vahlia*	*capensis*	LC (POSA)
Malvaceae	*Grewia*	*flava*	LC (POSA)	Fabaceae	*Vigna*	*unguiculata*	LC (POSA)
Malvaceae	*Grewia*	*flavescens*	LC (POSA)	Fabaceae	*Vigna*	*frutescens*	LC (POSA)
Malvaceae	*Grewia*	*occidentalis*	LC (POSA)	Santalaceae	*Viscum*	*verrucosum*	LC (POSA)
Celastraceae	*Gymnosporia*	*polyacantha*	LC (POSA)	Santalaceae	*Viscum*	*tuberculatum*	LC (POSA)
Celastraceae	*Gymnosporia*	*buxifolia*	LC (POSA)	Santalaceae	*Viscum*	*combreticola*	LC (POSA)
Asteraceae	*Helichrysum*	*harveyanum*	LC (POSA)	Santalaceae	*Viscum*	*rotundifolium*	LC (POSA)
Asteraceae	*Helichrysum*	*nudifolium*	LC (POSA)	Lamiaceae	*Vitex*	*zeyheri*	LC (POSA)
Rhamnaceae	*Helinus*	*integrifolius*	LC (POSA)	Campanulaceae	*Wahlenbergia*	*undulata*	LC (POSA)
Malvaceae	*Hermannia*	*floribunda*	LC (POSA)	Malvaceae	*Waltheria*	*indica*	LC (POSA)
Malvaceae	*Hermannia*	*depressa*	LC (POSA)	Olacaceae	*Ximenia*	*caffra*	LC (POSA)
Malvaceae	*Hermannia*	*umbratica*	LC (POSA)	Rutaceae	*Zanthoxylum*	*capense*	LC (POSA)
Malvaceae	*Hermannia*	*boraginiflora*	LC (POSA)	Rhamnaceae	*Ziziphus*	*mucronata*	LC (POSA)
Amaranthaceae	*Hermbstaedtia*	*odorata*	LC (POSA)	Rhamnaceae	*Ziziphus*	*zeyheriana*	LC (POSA)
Amaranthaceae	*Hermbstaedtia*	*odorata*	LC (POSA)	Fabaceae	*Zornia*	*milneana*	LC (POSA)

Schedule 2: List of Protected Species within the North West Province (NWBMA, 2016):

KINGDOM PLANTAE			
Column 1	**Column 2**	**Column 3**	**Column 4**
English common name	**Scientific Name**	**Setswana**	**Afrikaans**
	Aloe braamvanwykii		
	Anacampseros dicapitata		
	Barleria media		
	Blepharis angusta		
All species of the Genus	*Brachystelma* sp.		
	Ceropegia insignis		
	Ceropegia stentiae		
	Cineraria austrotransvaalensis		
	Cineraria exilis		
	Cleome conrathii		
	Commelina bella		
	Cynodon polevansii		
	Delosperma leendertziae		
	Dicliptera magaliesbergensis		
	Drimia sanguinea		
All species	*Euphorbia* sp., except *Euphorbia ingens*		
All Ferns, except the Bracken Fern *Pteridium aquilinum*	Division Pteridophyta		
Fairy Elephant's Foot	*Frithia pulchra*		
	Gladiolus filiformis		
	Gnaphalium nelsonii		
	Indigofera commixta		
	Kniphofia typhoides		
	Ledebouria atrobrunnea		
	Ledebouria confusa		
	Lessertia phillipsiana		
	Lithops leslei subsp. *leslei*		
	Lobelia cuneifolia var *ananda*		
	Miraglossum laeve		
	Nerine gracilis		
	Nuxia glomerulata		
	Rennera stellata		
	Searsia maricoana		
	Senecio holubii		
Tambotie	*Spirostachys africana*	Morukuru	Tambotie
	Sporobolus oxyphyllus		
	Stenostelma umbelluliferum		

CLASS MAMMALIA			
Column 1	**Column 2**	**Column 3**	**Column 4**
English common name	**Scientific Name**	**Setswana**	**Afrikaans**
Aardvark	*Orycteropus afer*	Thakadu	Erdvark
Aardwolf	*Proteles cristatus*	Thukhwi	Maanhaarjakkals
African Civet	*Civettictis civetta*	Tshipalore	Siwetkat
African Clawless Otter	*Aonyx capensis*	Lenyebi	Groototter
African Marsh Rat	*Dasymys incomtus*		Waterrot
All Bat species except for the Cape Serotine Bat *Neoromicia capensis*	Order Chiroptera	Mamanthwane	Vlermuise
Bat-eared Fox	*Otocyon megalotis*	Motlhose	Bakoorvos
Black-tailed Tree Rat	*Thallomys nigricauda*		Swartstertboomrot
Blesbok	*Damaliscus pygargus phillipsi*	Nônê	Blesbok
Blue Wildebeest	*Connochaetes taurinus*	Kgôkông	Blouwildebees
Buffalo	*Syncerus caffer*	Nare	Buffel
Bushbuck	*Tragelaphus scriptus*	Serôlô	Bosbok
All Dormouse species	Family Myoxidae	Mokomane	Waaierstertmuise
All Cat or Felid species	Family Felidae	Dikatse	Katte
Dwarf Mongoose	*Helogale parvula*	Lefswekete	Dwergmuishond
Eland	*Taurotragus oryx*	Phôhu	Eland
All Elephant Shrews or Sengis	Family Macroscelididae	Intufi	Klaasneuse
Giraffe	*Giraffa camelopardalis*	Thutlwa	Kameelperd
Gemsbok	*Oryx gazella*	Kukama	Gemsbok
All Golden Moles	Family Chrysochloridae	Serunya	Gouemolle
Grey Rhebok	*Pelea capreolus*	Phele	Vaalribbok
Hippopotamus	*Hippopotamus amphibius*	Kubu	Seekoei
Klipspringer	*Oreotragus oreotragus*	Kololo	Klipspringer
Kreb's Fat Mouse	*Steatomys krebsii*		Krebs se vetmuis
Maquassie Musk Shrew	*Crocidura maquassiensis*		Maquassie-skeerbek
Mountain Reedbuck	*Redunca fulvorufula*	Phele	Rooiribbok
Plains Zebra	*Equus zebra*	Pitse	Bontsebra
All Red Rock Rabbits	*Pronolagus* sp.	Tlhôlwê	Rooiklipkonyne
Red Hartebeest	*Alcelaphus buselaphus*	Kgama	Rooihartebees
Sable Antelope	*Hippotragus niger*	Pôtôkwane	Swartwitpens
South African Galago	*Galago moholi*	Mogwele	Nagapie
Striped Weasel	*Poecilogale albinucha*	Nakêdi	Slangmuishond
Waterbuck	*Kobus ellipsiprymnus*	Motumoga	Waterbok
White-tailed Rat	*Mystromys albicaudatus*		Witstertmuis
Woosnam's Desert Rat	*Zelotomys woosnami*	Sekuthê	Woosnam se woestyn rot