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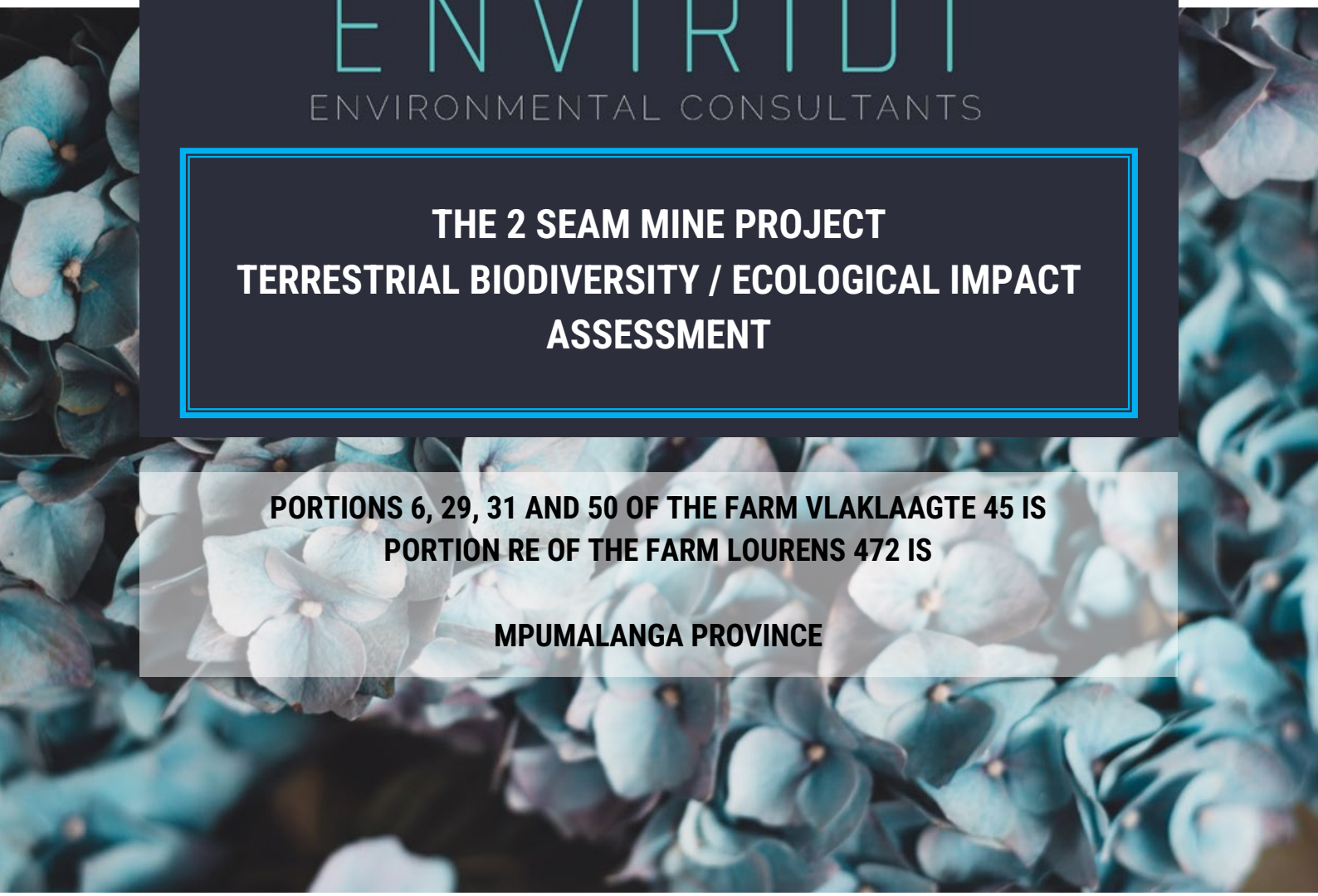
ENVIRONMENTAL CONSULTANTS

THE 2 SEAM MINE PROJECT
TERRESTRIAL BIODIVERSITY / ECOLOGICAL IMPACT ASSESSMENT



PORTIONS 6, 29, 31 AND 50 OF THE FARM VLAKLAAGTE 45 IS
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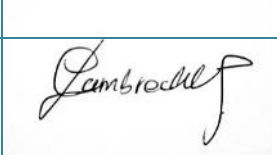
MPUMALANGA PROVINCE

DOCUMENT DETAILS & HISTORY

Report	**2 Seam (Pty) Ltd – Terrestrial Biodiversity / Ecological Impact Assessment**		
Client	Elemental Sustainability (Pty) Ltd 102 The Meridian, 160 AG De Witt Drive Solheim, 1401		
Responsible Person	Ms Sonja van de Giessen		
Report Number	E-S/2022/08/Draft V1	**Report Status**	Final Draft
Draft Report	30 August 2022	**Final Report:**	30 August 2022

DOCUMENT INFORMATION

Responsible person	**Date**	**Position**
Ms C Lambrechts	30 August 2022	Senior Specialist
Signature		
Responsible person	**Date**	**Position**
Ms N Upton	30 August 2022	Senior Specialist
Signature		

LIMITATIONS AND ASSUMPTIONS

- The layout presented within this document is thought to be the final at the time of the compilation of this report.
- It is assumed that species flowering only during specific times of the year could be confused with a very similar species of the same genus. Some plant species that emerge and bloom during another time of the year or under very specific circumstances may have been missed entirely.
- The site survey was undertaken on the 2nd of August 2022 which is not within the peak, spring flowering period in a summer rainfall region, but rather the dry, winter season. The timing of the site visits was thus not optimal, and the seasonal constraints on the comprehensiveness of the botanical findings are considered to be moderate to high. However, considering the general condition of vegetation and land-use on the study site, the data gathered during the site visit is considered sufficient for the purposes of this report and the Scope of Work for this study.
- Species flowering only during specific times of the year could be confused with a very similar species of the same genus and some plant species that emerge and bloom during another time of the year or under very specific circumstances may have been missed entirely.
- As part of the site survey a Species of Conservation Concern (SSC) scan was undertaken for SCC floral species identified during the desktop assessment. However, the SCC scan does not substitute an in-depth survey specifically for SCC.
- No scientific data was collected or analysed for the calculation of ecological veld condition. Any comments or observations made in this regard are based on observations, the expert knowledge and relevant professional experience of the specialist investigator.
- Riparian and wetland associated vegetation units were delineated on the presence of obligate and facultative flora species only and does not serve as a substitute of a comprehensive wetland delineation. The sensitivity rating provided in this Terrestrial Ecology

Assessment does not consider sensitivity buffers that are calculated and determined in a Wetland Assessment. It is none-the-less important the buffer areas indicated in the Wetland Assessment are considered in the project planning and implementation.

- Data collection in this study relied heavily on data from representative, homogenous sections of vegetation units, as well as general observations, analysis of satellite imagery from the past until the present, generic data, and a desktop analysis.
- Riparian areas refer to watercourses, rivers or streams and does not specifically cater for wetland zones. For aspects related to wetlands, the Wetland Delineation Report will need to be referred to.
- The specialist responsible for this study reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light

DECLARATION OF INDEPENDENCE

I, Corlien Lambrechts, declare that -

- I act as the independent specialist;
- I will perform the work relating to the project in an objective manner, even if this results in views and findings that are not favourable to the project proponent;
- 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 project, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998; 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 will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the project proponent 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 project; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority or project proponent;
- All the particulars furnished by me in this document are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of Specialist	
Name of Company	Enviridi Environmental Consultants (Pty) Ltd Pr.Sci.Nat (Registration number: 009135)
Date	30/08/2022

I, Nicole Upton, declare that -

- I act as the independent specialist;
- I will perform the work relating to the project in an objective manner, even if this results in views and findings that are not favourable to the project proponent;
- 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 project, including knowledge of the National Environmental Management Act, 1998 (Act No. 107 of 1998; 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 will take into account, to the extent possible, the matters listed in Regulation 8;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the project proponent 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 project; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority or project proponent;
- All the particulars furnished by me in this document are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of Specialist	
Name of Company	External for Enviridi Environmental Consultants (Pty) Ltd
Date	30/08/2022

DECLARATION OF INDEPENDENCE - REVIEWER

The specialist responsible for reviewing this particular specialist study declares that:

- At the time of reviewing this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being a member of the general public;
- I declare that there are no circumstances that may compromise my objectivity in reviewing this specialist investigation.
- I do not have any influence over decisions made by the governing authorities; should I, at any point, consider myself to be in conflict with any of the above declarations, I shall formally submit a Notice of Withdrawal to all relevant parties and formally register as an Interested and Affected Party;
- I have expertise and experience in conducting and reviewing specialist reports relevant to this application, including knowledge of the Act, regulations and guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- All the particulars furnished by me in this document are true and correct; and
- I realize that a false declaration is an offence in terms of Regulation 71 of NEMA and is punishable in terms of section 24F of the Act.

Peer Review	Ms Liezl Landman Pr.Sci.Nat (118084)
Signature of Specialist	
Date	12/09/2022

EXECUTIVE SUMMARY

This document has been prepared and submitted to Elemental Sustainability (Pty) Ltd in response to a request for a terrestrial biodiversity/ecology study for the proposed 2 Seam (Pty) Ltd Environmental Authorisation application on Portions 6, 29, 31 and 50 of the Farm Vlaklaagte 45 IS and Portion RE of the Farm Lourens 472 IS within Emalahleni Local Municipality and Nkangala District Municipality, Mpumalanga Province.

2 Seam is planning to add additional opencast mining areas (i.e., OC04A and OC04B) within the existing mining right boundary to extend the Life-of-Mine (LoM). Furthermore, 2 Seam will be applying for a coal washing plant and tailings facility on site, associated stormwater management infrastructure (PCDs and clean and dirty water berms), a contractor's yard and a river diversion.

2 Seam is an existing opencast coal mine, consisting of the original 2 Seam Mine Blocks OC1, OC2, OC2A, OC4, OC5 and OC6. The 2 Seam Mine Block OC6 and Block OC06A project fall within the footprint of historical underground mining operation known as Transvaal Navigation Colliery (TNC). 2 Seam has existing Run of Mine (RoM) stockpile areas located on rehabilitated opencast areas. 2 Seam holds one mining right (Mining Right (MP) 30/5/1/2/3/2/1 (405) EM). It produces coal for the local market.

According to the National Vegetation Map (SANBI 2006 – 2018) the project area is located in the Grassland biome. One vegetation type occurs in the project area, namely Eastern Highveld Grassland (Gm12).

Eastern Highveld Grassland is shown as Vulnerable and in the "National List of Ecosystems that are Threatened and need of protection", which is also reflected by the 2018 National Biodiversity Assessment.

The study area contains the following biodiversity classes from the Mpumalanga Biodiversity Sector Plan (MBSP):

- Modified ('Transformed'): The majority of the project footprint is located on areas categorised as Modified. The Modified areas are located in areas which have been transformed by current and historic mining activities and crop cultivation prior to mining. Based on the findings of the site survey, the specialist determined that these areas should be considered as Modified.
- Other Natural Areas (ONA): Sections of the proposed project footprint are located in areas categorised as ONA. Based on the findings of the site survey some of the areas categorised as ONA, would be more accurately designated as Modified, due to existing mining activities and crop cultivation. Refer to Vegetation Units as depicted in Figure 5.

No protected areas, in terms of National Environmental Management: Protected Areas Act 57 of 2003 (NEMPAA), are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km of the proposed road route.

FLORAL DESKTOP ASSESSMENT

Information on plant species previously recorded for the project area was extracted from the Plants of South Africa (POSA) online database hosted by SANBI. A list of plant species that have previously been recorded in the project area is provided in Appendix B. The results indicate that 125 plant species have been recorded in the area queried, consisting of 37 families. The most prominent family is Cyperaceae, with 28 species, followed by Asteraceae and Poaceae, with 11 species each.

Of the 125 species previously recorded for the area, two are Species of Conservation Concern (SCC) in terms of their Red List status. Four additional flora species were listed for the project area in the Environmental Screening Tool Report. The table below lists the SCC which may potentially occur on the project footprint. It should be noted that though none of these species were identified during the site survey, their likelihood of occurrence, in the specialist's opinion, is provided in the table below.

Flora SCC listed for the project area

Species	Red List Status	Occurrence
Argyrolobium longifolium	Vulnerable	Unlikely to occur
Khadia carolinensis	Vulnerable	Unlikely to occur
Sensitive species 41	Vulnerable	Moderate likelihood of occurrence (associated with wetlands)
Sensitive species 691	Vulnerable	Moderate likelihood of occurrence (associated with wetlands)

Species	Red List Status	Occurrence
Pachycarpus suaveolens	Vulnerable	Unlikely to occur
Brachycorythis conica subsp. *transvaalensis*	Critically Endangered	Low likelihood of occurrence

Five (5) flora species recorded on POSA for the area are listed as protected in the Mpumalanga Nature Conservation Act (MNCA), i.e. *Ceropegia rehmannii, Disa woodii, Gladiolus elliotii, Gladiolus papilio* and *Orthochilus leontoglossus*.

Three (3) species were found to possibly occur on site that have medicinal uses, i.e. *Helichrysum nudifolium, Pellaea calomelanos* and *Searsia dentata*.

Nine (9) of the flora species recorded on POSA for the area are endemic to South Africa (refer to Appendix B).

None of the flora species recorded on POSA for the project area are protected in terms of the NFA or the ToPs list.

Ten (10) exotic plant species were recorded to occur within the area queried, none of which are listed as an AIP species in terms of the NEMBA.

FAUNA DESKTOP ASSESSMENT

Appendix C list the faunal species for the 2629AB QDS and Table 8 lists all fauna species that are of conservation concern which were found during the desktop study. Only mammalian and avifaunal species with a red listed status are known to occur where the new 2 Seam Infrastructure are proposed.

Fauna SCC found in 2629AB QDS that may be relevant to the 2 Seam development

Species	Common name	Conservation status
Mammalian species		
Crocidura maquassiensis	Makwassie musk shrew	Vulnerable (2016) - As per Screening Tool Report
Dasymys robertsii	Robert's Marsh Rat	Near Threatened (2016)- As per Screening Tool Report
Ourebia ourebi	Oribi	Endangered, ToPS EN, MNCA Schedule 2
Felis nigripes	Black-footed Cat	Vulnerable (2016)
Leptailurus serval	Serval	Near Threatened (2016), MNCA Schedule 5
Otomys auratus	Southern African Vlei Rat (Grassland type)	Near Threatened (2016)
Hydrictis maculicollis	Spotted-necked Otter	Vulnerable, MNCA Schedule 2
Crocidura mariquensis	Swamp Musk Shrew	Near Threatened (2016)
Avifaunal species		
Sagittarius serpentarius	Secretarybird	VU (Regional), EN (Global) - Screening Tool Report
Oxyura maccoa	Duck, Maccoa	NT (Regional), VU (Global)
Phoenicopterus roseus	Flamingo, Greater	NT (Regional), LC (Global)
Eupodotis caerulescens	Korhaan, Blue	LC (Regional), NT (Global)
Geronticus calvus	Ibis, Southern Bald	VU (Regional), VU (Global)
(Tyto capensis	Owl, African Grass	VU (Regional), LC (Global) - Screening Tool Report
Glareola nordmanni	Pratincole, Black-winged	NT (Regional), NT (Global)
Calidris ferruginea	Sandpiper, Curlew	LC (Regional), NT (Global)
Coracias garrulus	Roller, European	NT (Regional), LC (Global)
Sterna caspia	Tern, Caspian	VU (Regional), LC (Global) - Screening Tool Report
Eupodotis senegalensis	Korhaan, White-bellied	VU (Regional), LC (Global) - Screening Tool Report

SITE SURVEY RESULTS

Habitat integrity and Floral species found
The project footprint is approximately 64 ha in extent.

The majority of the proposed project footprint (and extended 100 m project buffer) is located on land transformed by mining activities, with the remainder of the study site located on moderately to highly impacted grassland.

Land uses, on and adjacent to the project area, currently consist of mining and related activities, cropland, residences, and livestock grazing.

Vegetation units were identified according to plant species composition, previous land use and topography. The state of the vegetation of the proposed project area varies from being moderately impacted to completely transformed. The following broad classification of Vegetation Units (VU) were found to occur on the proposed project footprint and 100 m extended project area:

1. Impacted grassland (VU1);
2. Transformed land (VU2); and
3. Riparian and wetland (VU3).

A total of 62 plant species were recorded in the study area during the time of the study and indicates moderate species diversity, taking into consideration the transformed areas of VU2. 76% (48 of 62) of the recorded plant species are indigenous to South Africa. Fourteen (14) exotic species were recorded as occurring on the study area, of which six are listed as AIP in terms of the NEMBA.

From available literature it was established that at least three of the recorded plant species in the study area are to some extent used for medicinal purposes.

No SCC were identified to occur on the project footprint during the site survey. However, six flora SCC were identified for the project area during the desktop assessment, of which two were considered to be moderately likely to occur on the project footprint, specifically in the riparian and wetland habitats (VU3).

Habitat integrity and Faunal species found

Species were recorded as sighted, and occurrence verified based on signs and dung. The areas surveyed focussed mainly on the areas where surface impacts would occur, specifically the opencast, TSF and river diversion footprints and the sensitive ecological features identified during the desktop and based on arial footage.

Large sections of the area proposed is currently subjected to agricultural practices.

Thirty-seven (37) species have been sighted and one (1) national SCC species confirmed within the footprints. Mammals protected or regulated under MNCA have been found to occur as well, and these species should not be interfered with, nor relocated. Generally, the area was found to be visibly impacted, with predominant mining and agricultural activities prevalent in the surrounding area. Remaining natural footprint areas were mostly still fenced off from the current mining activities and once the project implementation begins, it could impact on sensitive habitat such as the various wetlands found to scattered over the landscape.

SENSITIVITY MAPPING AND GEOSPATIAL ANALYSIS

The site verification in terms of plant, animal and terrestrial biodiversity themes found that the majority of the project footprint is of low sensitivity (VU1 and VU2), with riparian zones rated as high sensitivity (VU3).

It is important to note that sensitivity buffers as calculated and determined in the Wetland Assessment have not been considered for the Terrestrial Ecology Sensitivity. It is none-the-less important the buffer areas indicated in the Wetland Assessment are taken into account in the project planning and implementation.

However, no substantial impacts to SCC are expected beyond the boundary of the preferred sites.

No protected areas, in terms of NEMPAA, are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km. No NPAES areas are situated within 10 km of the project footprint. The project footprint is not located in a SWSA or a FEPA.

It's the reasoned opinion of the specialist that the development may continue if all mitigation measures are implemented.

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ABBREVIATIONS

AEWA	African-Eurasian Migratory Waterbird Agreement
AIP	Alien and Invasive Programme
ADU	Animal Demographic Unit
BGIS	Biodiversity Geographical Information System
BLSA	Bird Life South Africa
CITES	Convention on International Union for Conservation of Nature
DAFF	Department of Agriculture, Forestry and Fisheries (Now DEFF)
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DEFF	Department of Environmental Affairs, Forestry and Fisheries
ECO	Environmental Control Officer
IAS	Invasive Alien Species
IUCN	International Union for Conservation of Nature
Ltd	Limited
MLRA	Marine Living Resources Act, 1998 (Act No. 18 of 1998)
NBA	National Biodiversity Assessment (NBA 2011)
NEM:BA	National Environmental Management: Biodiversity Act (No. 10 of 2004)
NEM:PA	National Environmental Management: Protected Areas Act 57 of 2003
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NPAES	National Protected Areas Expansion Strategy (NPAES 2008)
OCSLA	Office of the Chief State Law Advisor
POSA	Plants of South Africa
Pty	Proprietary
QDS	Quarter Degree Grid Cell
SABAP2	South African Bird Atlas Project 2
SANBI	South African Biodiversity Institute
SHEQ	Safety, Health, Environment and Quality Officer
ToPS	Threatened or Protected Species as published by the Minister
VM	Virtual Museum
VU	Vegetation Unit

INTRODUCTION AND SCOPE

1 INTRODUCTION

This document has been prepared and submitted to Elemental Sustainability (Pty) Ltd in response to a request for a terrestrial biodiversity/ecology study for the proposed 2 Seam (Pty) Ltd Environmental Authorisation application on Portions 6, 29, 31 and 50 of the Farm Vlaklaagte 45 IS and Portion RE of the Farm Lourens 472 IS within Emalahleni Local Municipality and Nkangala District Municipality, Mpumalanga Province.

2 Seam is planning to add additional opencast mining areas (i.e., OC04A and OC04B) within the existing mining right area to extend the Life-of-Mine (LoM). Furthermore, 2 Seam will be applying for a coal washing plant and tailings facility on site, associated stormwater management infrastructure (PCDs and clean and dirty water berms), a contractor's yard and a river diversion.

2 SCOPE AND AIM OF THE STUDY

The aim of this study includes the following objectives:

- General description of the biodiversity components in the study area;
- Description and mapping of the broad vegetation units (if more than one) identified in the study area;
- Identify, evaluate and discuss any sensitive areas and species that should be avoided during the proposed activities;
- Utilise the South African Biodiversity Institute (SANBI) Database to obtain specialized information and previous surveys within the area to supplement the field survey and support findings;
- To determine and assess associated impacts and risks;
- Relevant mitigation measures and a management plan will be proposed to reduce severity of impacts to the flora and fauna in the region; and
- To provide recommendations that will support the proposed management actions.

The baseline desktop fauna biodiversity study included the following aspects:

- A desktop study, which included determining the:
    - Endemic species; and
    - Red Data species (IUCN, SA Red Data Book & ToPS List).

- A field survey was conducted to determine the:
    - Likelihood of ecologically significant occurring in the area based on status of the environment;
    - Presence of endemic species;
    - Presence of exotic and invasive species;
    - Presence of IUCN Red Data species; and
    - Presence of culturally significant species.

The information from both the desktop and field survey was used to report on the following:

- Describing the project area in terms of the most recent International, National and Regional biodiversity status for species;
- To determine and complete an impact assessment and risk evaluation;
- Mitigation measures and a management plan will be proposed to reduce severity of impacts to the flora and fauna in the region;
- To provide recommendations that will support the proposed management actions;
- To provide an assessment of the result obtained; and
- Ensure compliance and alignment with latest regulations as published in October 2020 and 2021).

METHODOLOGY UTILISED

3 METHODOLOGY AND APPROACH UTILISED

It is important to note that many parts of South Africa contain high levels of biodiversity at species and ecosystem level. At any single site there may be large numbers of species or high ecological complexity. Sites also vary in their natural character and uniqueness and the level to which they have previously been disturbed. Assessing the impacts of a proposed project often requires evaluating the conservation value of the site relative to other natural areas in the surrounding area.

A simple approach to evaluating the relative importance of a site and the species found within it includes assessing the following:

- Is the site unique in terms of natural or biodiversity features?
- Is the protection of biodiversity features on site of national/provincial importance?
- Would development of the site lead to contravention of any international, national or provincial legislation, policy, convention or regulation?
- Is the site modified/disturbed in any way?

Thus, the general approach and angle adopted for this type of study is to identify any potential fauna and flora species that may be affected by the proposed development. This means that the focus of this report will be on rare, threatened, protected and conservation-worthy species. The general approach adopted for this type of study is thus to identify any critical biodiversity issues that may lead to the decision that the proposed project cannot take place, i.e., to specifically focus on red flags and/or potential fatal flaws.

Biodiversity issues are assessed by documenting whether any important biodiversity features occur on site, including species, ecosystems or processes that maintain ecosystems and/or species. Rare, threatened, protected and conservation-worthy species and habitats are considered to be the highest priority, the presence of which is most likely to result in significant negative impacts on the ecological environment. The focus on national and provincial priorities and critical biodiversity issues is in line with National Legislation protecting environmental and biodiversity resources.

Sites vary in their natural character and uniqueness and the level to which they have been previously disturbed. Assessing the potential impacts of a proposed development often requires evaluating the conservation value of a site relative to other natural areas and relative to the national importance of the site in terms of biodiversity conservation. A simple approach to evaluating the relative importance of a site includes assessing the following:

- Is the site unique in terms of natural or biodiversity features?
- Is the protection of biodiversity features on the site of national/provincial importance?
- Would development of the site lead to contravention of any international, national or provincial legislation, policy, convention or regulation?

Thus, the general approach adopted for this type of study is to identify any critical biodiversity issues that may lead to the decision that the proposed project cannot take place, i.e. to specifically focus on red flags and/or potential fatal flaws. Biodiversity issues are assessed here by documenting whether any important biodiversity features occur on site, including species, ecosystems or processes that maintain ecosystems and/or species. These can be organized in a hierarchical fashion, as follows:

- **Species:**
  1. threatened fauna or flora species; and
  2. protected trees.
- **Ecosystems:**
  1. threatened ecosystems;
  2. protected ecosystems;
  3. critical biodiversity areas;
  4. areas of high biodiversity; and
  5. centres of endemism.
- **Processes:**
  1. corridors;
  2. mega-conservancy networks;

3. rivers and wetlands; and
4. important topographical features.

It is not the intention to provide comprehensive lists of all species that occur on site, since most of the species on these lists are usually common or widespread species. Rare, threatened, protected and conservation-worthy species and habitats are considered to be the highest priority, the presence of which are most likely to be significantly negatively affected if development occurs. The focus on National and Provincial priorities and critical biodiversity issues is in line with National legislation protecting environmental and biodiversity resources.

3.1 Literature review and desktop study

A desktop assessment was conducted to establish whether any potentially sensitive species/receptors might occur on site. The South African National Biodiversity Institute's online biodiversity tool, ADU (Animal Demography Unit) Virtual Museum was used to query a species list for the Quaternary Degree Square (QDS) within which the study area is situated. Information regarding species of conservation concern was obtained prior to the field investigation. This was conducted by researching all available information resources including, but not limited to, the following:

- International Union for Conservation of Nature (IUCN) Red List of Threatened Species;
- The Endangered Wildlife Trust's Red List of Mammals of South Africa, Lesotho and Swaziland; and
- NEMBA List of Threatened or Protected Species (ToPS List).

Note that all resources used has been listed in the reference section of this report.

To describe the overall site characteristics, and to identify points of interest within the site for evaluation, Google Earth Imagery and the 1:50 000 topographical maps were examined.

The importance of a desktop study is to provide a reference condition to determine the current state of the environment and to draw comparisons between the potential of the area and current degradation from surrounding land uses. Consequently, it was possible to identify potential areas of concern and to draw up a list of potential species that may be affected by the proposed development.

3.2 Field investigation

A field investigation has been undertaken on the 3rd of August 2022 to supplement and confirm several findings from the desktop study. This mainly served as a fatal flaw analysis to determine whether any major ecological concerns exist with regards to the study area surface infrastructure establishment.

During the field investigation the observed and derived presence of fauna associated with the recognised habitat types of the study site, were recorded. In addition, fauna was also identified by means of spoor, droppings, burrows, or shelters. No trapping or mist netting was conducted, as the scope of work did not require such intensive work.

The site was traversed on foot and species recorded as they were encountered. Specific aspects that were investigated during the site verification were potential impacts of the development the remaining natural environment and the status of the current natural environment within the study area, indicating indigenous nature and habitat integrity.

The following data was recorded during the site verification:

- All identifiable indigenous and exotic flora species;
- All identifiable fauna species encountered during the site verification; and
- General ecological and habitat data that may assist in the description of the ecological context of the study area.

As part of the site verification a Species of Conservation Concern (SSC) scan was undertaken for SCC floral species identified during the desktop assessment.

A plotless sampling method was used to record data. Fauna and flora species observed in the study area (development footprint and 100 m extended project area) during the time of the study were recorded and included in the species lists. Plant species identification was done following the checklist of Germishuizen & Meyer (2003).

3.3 Data analyses

Information obtained during the desktop assessment and the field survey were analysed and compared. Data interpretation and conclusions made were deduced from specialist knowledge, available literature and case studies. The habitat availability for sensitive fauna species which was assessed throughout the study area were furthermore included in the analysis as well as the potential impact of the development on sensitive fauna species.

Geospatial analysis in terms of sensitive areas and known species distribution were used in comparison with the data gathered to make certain deductions. This will also aid the planning and positioning of the infrastructure as well as management for the various proposed development activities. Better protection will be awarded to sensitive areas that have unique species compositions or sensitive habitat types.

3.4 Sensitivity Assessment

The purpose of producing a habitat sensitivity map is to provide information on the location of potentially sensitive features in the study area. This was compiled by taking the following into consideration:

1. The general status of the vegetation of the study area was derived by compiling a landcover data layer for the study area (Fairbanks *et al*. 2000) using available satellite imagery and aerial photography. From this it can be seen which areas are likely to be transformed versus those that are still in a natural status. This status stratification was then verified in the field using on-the-ground information on species composition and vegetation structure.
2. Various Provincial, Regional or National level conservation planning studies have been undertaken in the area. The mapped results from these were taken into consideration in compiling the habitat sensitivity map.
3. Habitats in which various species occur that may be protected or are considered to have high conservation status are considered to be sensitive.

An explanation of the different sensitivity classes is given in Table 1. Areas containing untransformed natural vegetation that is important for Red List organisms are considered potentially sensitive. In contrast, any transformed area that has no importance for the functioning of ecosystems is considered to potentially have low sensitivity.

Table 1: Explanation of sensitivity ratings

Sensitivity	Factors contributing to sensitivity
No-go areas	Indigenous natural areas that are highly positive for the following: • Presence of habitats critical for the survival of populations of threatened species (Critically Endangered, Endangered, Vulnerable).
High	Indigenous natural areas that are highly positive for any of the following: • Presence of threatened species (Critically Endangered, Endangered, Vulnerable). And may also be positive for the following: • High intrinsic biodiversity value (high species richness and/or turnover, unique habitat). • Presence of habitat highly suitable for threatened species (Critically Endangered, Endangered, Vulnerable species). • Low ability to respond to disturbance (low resilience, dominant species very old).
Medium	• Other indigenous natural areas in which factors listed above are of no particular concern. • May also include natural buffers around ecologically sensitive areas and natural links or corridors in which natural habitat is still ecologically functional. • Degraded or disturbed indigenous natural vegetation. May also include secondary vegetation in an advanced stage of development in which habitat is still ecologically functional and which could potentially provide habitat for species of concern.
Low	No natural habitat remaining.

LEGISLATION RELATING TO ECOLOGY

4 SPECIFIC LEGISLATION REQUIREMENTS

4.1 Provincial Specifications: Mpumalanga Nature Conservation Act (Act No. 10 of 1998) (MNCA)

This Act makes provision with respect to nature conservation the Mpumalanga province. It provides for, among other things, protection of wildlife, hunting, fisheries, protection of endangered fauna and flora as listed in the Convention on international Trade in Endangered Species of Wild Fauna and Flora, the control of harmful animals, freshwater pollution and enforcement.

SCHEDULE 1: Specially protected game (section 4(1)(a))
SCHEDULE 2: Protected game (section 4(1)(b))
SCHEDULE 4: Protected wild animals (section 4(1)(d))
SCHEDULE 5: Wild animals to which the provisions of section 33 apply
SCHEDULE 6: Exotic animals to which the provisions of section 34 apply
SCHEDULE 7: Invertebrates (section 35(1))
SCHEDULE 8: Problem animals (section 44(1))
SCHEDULE 11: Protected plants (section 69(1) (a))
SCHEDULE 12: Specially protected plants (section 69(1)(b))
SCHEDULE 13: Invader weeds and plants (section 80(1)(a))

This Act must be interpreted and applied in accordance with the national environmental management principles set out in Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

4.2 National Environmental Management Act, 2004 (Act No. 10 of 2004)

4.2.1 Notice 151 of 2007 (ToPS List)

The Minister of Environmental Affairs and Tourism has in terms of section 97 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), made the regulations relating to listed threatened and protected species as set out in the Schedule.

The status provided by the Government Gazette in terms of Notice implies:

- *Critically endangered: Section 56(1)(a) applies to the species awarded this status in terms of NEM:BA5F[1], meaning: "Critically endangered species, being any indigenous species facing an extremely high risk of extinction in the wild in the immediate future".*
- *Endangered species: Section 56(1)(b) applies to the species awarded this status in terms of NEM:BA, meaning: "Endangered species, being any indigenous species facing a high risk of extinction in the wild in the near future, although they are not a critically endangered species".*
- *Vulnerable species: Section 56(1)(c) applies to the species awarded this status in terms of NEM:BA, meaning: "Vulnerable species, being any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future, although they are not a critically endangered species or an endangered species".*
- *Protected species: Section 56(1)(d) applies to the species awarded this status in terms of NEM:BA, meaning: "Protected species, being any species, which are of such high conservation value or national importance that they require national protection, although they are not listed in terms of paragraph (a), (b) or (c)".*

All listed animals in terms of the Act need special permits to be handled, kept, breeding or any other form of propagating, trade and relocation/moving. Any action intended in terms of potential harm, hunting, destruction/killing or international trade are in most cases prohibited.

[1] National Environmental Management: Biodiversity Act, 1998 (Act 10 of 1998)

4.2.2 Notice 389 of 2013 (Draft Regulations NEM:BA)

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) has a yearly update and publication of lists of species that are threatened of protected and activities that are prohibited and exemption from restriction. The latest update is Government Gazette Notice 389 of 2013, published on the 16 April 2013. An amendment of this has been published in 2015 for public comment as well.

The promulgated version, 23 February 2007[2], has also been incorporated into this report, refer to Section 4.2.1.

4.3 Government Gazette Notice No. 599 of 2014 – Alien and Invasive Species

The Department of Environmental Affairs (DEA) manages Invasive Alien Species (IAS) under the NEM:BA.

The four different categories that NEM:BA classify Alien Invasive Species under are:

- Category 1a: Invasive species that may not be owned, imported into South Africa, grown, moved, sold, given as a gift or dumped in a waterway. These species need to be controlled on your property, and officials from the Department of Environmental Affairs must be allowed access to monitor or assist with control.
- Category 1b: Invasive species that may not be owned, imported into South Africa, grown, moved, sold, given as a gift or dumped in a waterway. Category 1b species are major invaders that may need government assistance to remove. All category 1b species must be contained, and in many cases, they already fall under a government sponsored management programme.
- Category 2: These are invasive species that can remain in your garden, but only with a permit, which is granted under very few circumstances.
- Category 3: These are invasive species that can remain in your garden. However, you cannot propagate or sell these species and must control them in your garden. In riparian zones or wetlands all category 3 plants become category 1b plants.

4.4 Government Gazette Notice No. 1003 of 18 September 2020 – Alien and Invasive Species

Notice 1: Notice in respect of Categories 1a, 1b, 2 and 3, Listed Invasive Species, in terms of which certain Restricted Activities are prohibited in terms of section 71A (1); exempted in terms of section 71(3); require a Permit in terms of section 71(1)

Notice 2: Exempted Alien Species in terms of section 66(1).

Notice 3: National Lists of Invasive Species in terms section 70(1):

List 1:	National List of Invasive Terrestrial and Fresh-water Plant Species
List 2:	National List of Invasive Marine Plant Species
List 3:	National List of Invasive Mammal Species
List 4:	National List of Invasive Bird Species
List 5:	National List of Invasive Reptile Species
List 6:	National List of Invasive Amphibian Species
List 7:	National List of Invasive Fresh-water Fish Species National List of Invasive Marine Fish Species
List 8:	National List of Invasive Terrestrial Invertebrate Species
List 9:	National List of Invasive Fresh-water Invertebrate Species
List 10:	National List of Invasive Marine Invertebrate Species
List 11:	National List of Invasive Microbial Species

4.5 The National Forests Act, 1998 (Act No. 84 of 1998) (NFA)

The NFA:

- Promotes the sustainable management and development of forests for the benefit of all;
- Creates the conditions necessary to restructure forestry in State Forests;
- Provide special measures for the protection of certain forests and protected trees;
- Promotes the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.
- Promotes community forestry.

[2] https://pmg.org.za/committee-meeting/29811/

In terms of the NFA, forest trees or protected tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the Department of Agriculture, Forestry and Fisheries (DAFF – now DEFF).

4.6 National List of Threatened Terrestrial Ecosystems (2011)

NEM:BA provides for listing of threatened or protected ecosystems, in one of four categories:

- Critically Endangered;
- Endangered;
- Vulnerable; or
- Protected.

Threatened ecosystems are listed in order to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, BGIS).

4.7 National Protected Areas Expansion Strategy (NPAES 2008)

The National Protected Area Expansion Strategy was approved for implementation in March 2009. The NPAES was commissioned by the Department of Environmental Affairs and Tourism (DEAT), now known as the Department of Environment Affairs (DEA), with technical support from the South African National Biodiversity Institute (SANBI) and South African National Parks (SANParks).

The NPAES provides a common set of targets and spatial priorities to guide efforts and enable co-ordination among the many role players involved in protected area expansion. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial and human resource constraints on the other.

A revision to the strategy has occurred in 2016, but implementation has not been verified.

4.8 National Biodiversity Assessment (NBA 2011)

The National Biodiversity Assessment (2011) provides an assessment of South Africa's biodiversity and ecosystems, including headline indicators and national maps for the terrestrial, freshwater, estuarine and marine environments. The NBA (2011) was led by SANBI in partnership with a range of organisations. It follows on from the National Spatial Biodiversity Assessment (2004), broadening the scope of the assessment to include key thematic issues as well as a spatial assessment. The NBA (2011) includes a summary of spatial biodiversity priority areas that have been identified through systematic biodiversity plans at national, provincial and local levels (SANBI, BGIS).

4.9 National Biodiversity Assessment (NBA; 2018)

The NBA 2018 is the third such assessment for South Africa – following the National Spatial Biodiversity Assessment 2004 and the National Biodiversity Assessment 2011. The NBA 2018's goals of improving ecosystem classification and mapping, introducing a species protection level indicator and potential genetic diversity indicators, and including South Africa's sub-Antarctic territory for the first time were all met. In addition, this NBA trialled the new IUCN Red List of Ecosystem criteria and was able to track trends in species status and habitat loss for the first time. The NBA 2018 has involved nearly five years' ground-breaking work from 2015 to 2019. The National Biodiversity Assessment (NBA) is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. It is used to inform policies, strategies and actions in a range of sectors for managing and conserving biodiversity more effectively.

Each NBA is named after the year of the data underpinning the assessment. The third NBA, NBA 2018, was released in October 2019.

The South African Protected Areas Database (SAPAD), maintained by Department of Environment, Forestry and Fisheries (DEFF) and released quarterly, formed the core of the protected area dataset used in this NBA. The database required various restructuring steps for use in the protection level analysis. Overlaps were resolved and inconsistencies between conservation agency data and SAPAD were investigated and resolved. The strength of this dataset is that it includes designation dates and allows for time-series protection analysis; while a limitation of the dataset is that many of the privately owned nature reserves declared prior to publication of the Biodiversity Act have yet to be validated.

4.10 NEMA, GN No. 648 of 10 May 2019 and GN No. 9 of 10 January 2020

Government Notice 648 first described the intention to publish procedures to be followed for the assessment and minimum criteria for reporting of identified environmental themes in terms of section 24(5)(a) and (h) of the National Environmental Management Act, 1998, when applying for Environmental authorisation and the Minister again gave notice of her intention to prescribe protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring environmental authorisation on the 10th of January 2020. In February 2020, the commenting period had been extended to 24 March 2020.

These regulations have not been in effect during the compilation of this report, but regulations published on the 30th of October 2020 will need to be adhered to for future studies. Since the study had already commenced prior to the commencement of these regulations, the GN320 Regulations as published in March 2020 has been adhered to.

4.11 Promulgated Requirements for Specialist Reports – Specific Requirements to be met

Government Notice R982 as published in Government Gazette 38282 dated 4 December 2014 and as amended by Government Notice 326 in Government Gazette 40772 dated 7 April 2017 (as amended 2021), outlines in Appendix 6 the requirements for specialist reports. The table below provides an overview of the requirements and the applicable sections of this report.

Table 2: Legislative report requirements GNR982

GNR982 as amended by GN326	Report Section
(1) A specialist report prepared in terms of these Regulations must contain–	
(a) details of–	
(i) the specialist who prepared the report; and	Page i
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Appendix D
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii-iv
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 2, Section 6
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 9.4.1.3, Section 9.4.1
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
(f) details of an assessment of the 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 site alternative;	Section 8 – No alternative exists
(g) an identification of any areas to be avoided, including buffers;	Section 8
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 14, Figure 15, Figure 16.
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	First Section of report
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 9, Section 9.4.1
(k) any mitigation measures for inclusion in the EMPr;	Section 10
(l) any conditions for inclusion in the environmental authorisation;	Section 10
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 10
(n) a reasoned opinion–	Section 11 and Executive Summary – last paragraph
(i) whether the proposed activity, activities or portions thereof should be authorised;	Section 11
(iA) regarding the acceptability of the proposed activity or activities; and	Section 11
(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 11 and Executive Summary – last paragraph
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Not applicable
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Not applicable
(q) any other information requested by the competent authority.	Not applicable

GNR982 as amended by GN326	Report Section
(2) Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Not applicable

On 20 March 2020 "*Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the NEMA when applying for environmental authorization*" was published in GN 320 (Government Gazette 43110).

It is important to note that the protocol replaces the requirements of Appendix 6 of the EIA Impact regulations as outlined above. The protocol as published are outlined below.

Table 3: Content of specialist report GN320 – Table combined for Fauna, Floral & Terrestrial Biodiversity Minimum Requirements

Requirement	Section
1. General Information 1.1 An applicant, intending to undertake an activity as identified in the scope of this protocol on a site identified as being of "very high", "high" or "medium" sensitivity for terrestrial animal species on the national web based environmental screening tool must submit a Terrestrial Species Impact Assessment Report.	This Report
1.2 However, where the information gathered from the initial site sensitivity verification identified in section 2 of this protocol or the specialist assessment differs from the designation of "very high", "high", or "medium" terrestrial animal species sensitivity from the national web based environmental screening tool and it is found to be of a "low" sensitivity, then a Terrestrial Species Impact Assessment is not required.	A Specialist Report was required as sections of High sensitivity overlap with the specific farm and footprint in terms of Terrestrial Biodiversity.
1.3 Should paragraph 1.2 apply, a Terrestrial Species Compliance Statement must be submitted. An environmental assessment practitioner or a suitably qualified taxon relevant specialist, registered with the South African National Council for Natural Scientific Professionals (SACNASP), must append to the Terrestrial Species Compliance Statement a motivation and evidence (e.g. photographs) of the different terrestrial animal species sensitivity.	No Compliance statement is necessary – a full impact assessment report had been conducted (refer below)
Additional as noted for Terrestrial Biodiversity Studies specifically	
2.3. The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects: 2.3.1. a description of the ecological drivers or processes of the system and how the proposed development will impact these;	The sites have been found to be modified to various degrees, but always has increased sensitivity if remnants of natural composition remain and for the Olifants river.
2.3.2. Ecological functioning and ecological processes (e.g. fire, migration, pollination, etc.) that operate within the preferred site;	The site does not have specific increased value in terms of migration, pollination or other. Fire is always a risk in Grassland. The Olifants river is an aquatic corridor and is important for migration of associated species.
2.3.3. The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	The riverine and drainage features in the regional area could potentially be valued as an ecological corridor. This is where the river diversion is proposed.
2.3.4. The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of strategic water source areas (SWSAs) or freshwater ecosystem priority area (FEPA) sub catchments;	The project footprint is not located in a SWSA or a FEPA.
2.3.5. a description of terrestrial biodiversity and ecosystems on the preferred site, including: a) main vegetation types; b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;	Section 5.3, 6.1, Section 5.4. The Field assessment delineated Vegetation Units in Section 7.1.
The assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	Most of the proposed OC areas have impacted

Requirement	Section
	footprints, however, sensitive areas do exist.
The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify: Terrestrial critical biodiversity areas (CBAs), including: a) the reasons why an area has been identified as a CBA; b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation; c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s); d) the impact on ecosystem threat status; e) the impact on explicit subtypes in the vegetation; f) the impact on overall species and ecosystem diversity of the site; and g) the impact on any changes to threat status of populations of species of conservation concern in the CBA; Terrestrial ecological support areas (ESAs), including: (a) the impact on the ecological processes that operate within or across the site; (b) the extent the proposed development will impact on the functionality of the ESA; and (c) loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;	All sites fall within Transformed Areas and sections overlap with "Other Natural Areas", specifically those associated with drainage and the river system.
Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan; b) priority areas for protected area expansion, including- (a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;	Section 8 includes a paragraph regarding the closest protected areas and NPAES focus areas. It also includes SAPAD and SACAD Database findings.
SWSAs including: a) the impact(s) on the terrestrial habitat of a SWSA; and b) the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses); c) FEPA sub catchments, including- the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;	The project footprint is not located in a SWSA or a FEPA.
Indigenous forests, including: a) impact on the ecological integrity of the forest; and (b) percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.	No indigenous forests occur on the site – confirmed during the field assessment
2. Terrestrial Species Impact Assessment 2.1 The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	The specialists are suitably qualified, and the report was peer reviewed.
2.2 The assessment must be undertaken on the preferred site and within the proposed development footprint.	Section 7
2.3 The Terrestrial Species Impact Assessment must be undertaken in accordance with the *Species Environmental Assessment Best Practice Guidelines 3* and must identify the following: 2.3.1 The species of conservation concern which were found on site;	Section 6 (Desktop), Section 7 (field Assessment)
2.3.2 The distribution, location, viability (ability to survive and reproduce in future) and detailed description of population size of the species of conservation concern identified on the preferred development site;	Section 7.1, 7.2, Section 7
2.3.3 The nature and the extent of the potential impact of the proposed development on the species of conservation concern on the proposed development site;	Section 9.4
2.3.4 The importance of the conservation of the population of the species of special concern identified on the proposed development site based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	Section 6 (Desktop), Section 7 (field Assessment). All species have been awarded with the relevant SCC within the tables presented.
2.3.5 The potential impact of the proposed development on the habitat of the species of conservation concern;	Section 9.4, Section 7.2.1
2.3.6 Any dynamic ecological processes occurring within the site and its surrounds that might be disrupted by the proposed development and resulting impact on the identified species of conservation concern; for example, fires in fire-prone systems;	Grassland are fire prone systems specifically during drought periods.

Requirement	Section
2.3.7 Any potential impact of ecological connectivity (on site, and in relation to the broader landscape) and resulting impact on the identified species of conservation concern;	Section 8, Section 9 No other relevant ecological connectivity besides the riverine areas, where sensitive vegetation and habitats which could support SCC occur.
2.3.8 Buffer distances as per the *Species Environmental Assessment Best Practice Guidelines* used for the population of each species of conservation concern;	Section 8
2.3.9 The likelihood of other threatened species, undescribed species or highly localised endemics, migratory species, or species of conservation concern, occurring in the vicinity; and	Section 6 and Section 7.
2.3.10 Identify any alternative development footprints within the preferred development site which would be of "low" sensitivity as identified by the national web based environmental screening tool and verified through the initial site sensitivity verification.	Section 8
3. The findings of the Terrestrial Animal Species Impact Assessment must be written up in a Terrestrial Animal Species Impact Assessment Report.	This Report
This report must include as a minimum the following information: 3.1 Contact details and curriculum vitae of the specialist including SACNASP registration number and fields of expertise;	Page i and Appendix D
3.2 A signed statement of independence by the specialist;	Page ii-iv
3.3 Duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
3.4 A description of the methodology used to undertake the impact assessment and site inspection, including equipment and modelling used where relevant;	Section 3
3.5 A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Page ii
3.6 Areas not suitable for development, to be avoided during construction and operation where relevant; additional environmental impacts expected from the proposed development; - any direct, indirect and cumulative impacts of the proposed development; - the degree to which impacts and risks can be mitigated; - the degree to which the impacts and risks can be reversed; - the degree to which the impacts and risks can cause loss of irreplaceable resources;	Section 8 and Section 9
3.7 Additional environmental impacts expected from the proposed development based on those already evident on the site and a discussion on the cumulative impacts; and	Section 9.4.1.3
3.8 Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 10
3.9 A reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not, and any conditions to which the opinion is subjected;	Section 11 and Executive Summary – last paragraph
3.10. A motivation must be provided if there were development footprints identified as per paragraph 2.3.10 above that were identified as having a "low" terrestrial animal species sensitivity and were not considered appropriate.	N/A
4. The findings of the Terrestrial Impact Assessment must be incorporated into the Basic Assessment Report (BAR) or the Environmental Impact Assessment Report (EIAR), including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr. A signed copy of the assessment must be appended to the BAR or EIAR.	N/A – Done by EAP

4.11.1 Government Notice No. 1150 of 30 October 2020

This Government Notice finalised and replaced the March 2020 regulations by publishing procedures for the assessment and minimum criteria for reporting on Identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of The National Environmental Management Act, 1998, when applying for Environmental authorisation.

Statement 2: Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a site sensitivity verification[3].

2.1 The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.

2.2 The site sensitivity verification must be undertaken through the use of:

[3] The site sensitivity verification is to confirm the actual use of the land on the ground versus that which has been identified by the screening tool. The site sensitivity verification will confirm or refute the need to employ the various specialists as identified in the screening report. The site sensitivity report does not form part of the specialist report but is to be submitted together with the relevant Authorisation reports.

a) a desktop analysis, using satellite imagery;
b) a preliminary on-site inspection; and
c) any other available and relevant information.

2.3 The outcome of the site sensitivity verification must be recorded in the form of a report that:

a) confirms or disputes the current use of the land and environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

4.11.1.1 Terrestrial Animal Species

Statement 3 provides the following minimum requirements to be met within the specialist reports.

Table 4: Contents of GN 1150 of 30 October 2020

ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL ANIMAL SPECIES	
Requirement	**Section**
General Information An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "very high" or "high" sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Specialist Assessment Report. An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "medium sensitivity" for terrestrial animal species must submit either a Terrestrial Animal Species Specialist Assessment Report or a Terrestrial Animal Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4. An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of "low" sensitivity for terrestrial animal species must submit a Terrestrial Animal Species Compliance Statement. Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" or "high", for terrestrial animal species sensitivity and it is found to be of a "low" sensitivity, then a Terrestrial Animal Species Compliance Statement must be submitted. Where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" terrestrial animal species sensitivity and it is found to be of a "very high" or "high" terrestrial animal species sensitivity, a Terrestrial Animal Species Specialist Assessment must be conducted. If any part of the development falls within an area of confirmed "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol means, the area on which the proposed development will take place and includes the area that will be disturbed or impacted. The Terrestrial Animal Species Specialist Assessment and the Terrestrial Animal Species Compliance Statement must be undertaken within the study area. <u>Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.</u> <u>Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline, and the study area must include the PAOI, as determined.</u>	This Report. No Compliance statement is utilised – a full impact assessment report had been conducted. A Specialist Report was required as sections of High sensitivity overlap with the specific farm and footprint in terms of Terrestrial Biodiversity. Refer to Section 8 where the relevance of these requirements has been discussed.

<table>
<tr>
<td rowspan="10">VERY HIGH SENSITIVITY RATING – for terrestrial animal species:

1. Critical habitat for range-restricted species of conservation concern, that have a global range of less than 10 km^2.

SCC listed on the IUCN Red List of Threatened Species or on South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare.

Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle.

The number of mature individuals that ranks the site among the largest 10 aggregations known for the species.

These areas are irreplaceable for SCC</td>
<td>Terrestrial Animal Species Specialist Assessment

The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professions (SACNASP) with a field of practice relevant to the taxonomic group ("taxa") for which the assessment is being undertaken.</td>
<td>Page i and Page ii of the report and Appendix D

<table>
<tr><th>Sensitivity</th><th>Feature(s)</th></tr>
<tr><td>High</td><td>Aves-Tyto capensis</td></tr>
<tr><td>Medium</td><td>Aves-Tyto capensis</td></tr>
<tr><td>Medium</td><td>Aves-Hydroprogne caspia</td></tr>
<tr><td>Medium</td><td>Aves-Sagittarius serpentarius</td></tr>
<tr><td>Medium</td><td>Aves-Eupodotis senegalensis</td></tr>
<tr><td>Medium</td><td>Mammalia-Crocidura maquassiensis</td></tr>
<tr><td>Medium</td><td>Mammalia-Dasymys robertsii</td></tr>
<tr><td>Medium</td><td>Mammalia-Hydrictis maculicollis</td></tr>
<tr><td>Medium</td><td>Mammalia-Ourebia ourebi ourebi</td></tr>
</table>
</td>
</tr>
<tr><td>The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline; and must;
identify the SCC which were found, observed or are likely to occur within the study area;</td><td>SCC were observed, but baseline data is included in the report and field data and the Olifants river could and does serve as habitat to SCC.</td></tr>
<tr><td>Provide evidence (photographs or sound recordings) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility, immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);</td><td>One (1) faunal SCC (National) have been found to occur during the field assessment. The baseline data recorded SCC in the area, and these are provided in Section 6.</td></tr>
<tr><td>identify the distribution, location, viability and provide a detailed description of population size of the SCC, identified within the study area;</td><td>Section 6 where applicable</td></tr>
<tr><td>Identify the nature and the extent of the potential impact of the proposed development on the population of the SCC located within the study area;</td><td>Section 8, Section 9 and Section 10</td></tr>
<tr><td>Determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases, including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;</td><td>Section 6 where applicable. Also refer to Section 8</td></tr>
<tr><td>Determine the potential impact of the proposed development on the habitat of the SCC located within the study area;</td><td>Section 9. Impact on habitat has been included and assessed</td></tr>
<tr><td>Include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, include a motivation for the deviation;</td><td>Section 6 where applicable. If any SCC has been found, it has been described in Section 7.</td></tr>
<tr><td>Identify any dynamic ecological processes occurring within the broader landscape that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;</td><td>Sections marked with high sensitivity is an important ecological feature and has been marked as elevated sensitivity. Grassland is a fire prone system.</td></tr>
</table>

	Identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;	The site does not have specific increased value in terms of migration, pollination or other. However, the riverine and drainage features in the area could potentially be valued as an ecological corridor.
	Determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;	Section 8.
	Discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species; or roosting and breeding or foraging areas used by migratory species where these species show significant congregations, occurring in the vicinity; and	Section 6 where applicable. If any SCC has been found, it has been described in Section 7.
	Identify any alternative development footprints within the preferred site which would be of "low" or "medium" sensitivity as identified by the screening tool and verified through the site sensitivity verification	Section 8.
HIGH SENSITIVITY RATING – for terrestrial animal species: Confirmed habitat for SCC. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare. These areas are unsuitable for development due to a very likely impact on SCC.	2.3 The findings of the assessment must be written up in a Terrestrial Animal Species Specialist Assessment Report. This report must include as a minimum the following information:	This report.
	Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;	Page i and Page ii of the report and Appendix D
	a signed statement of independence by the specialist;	Page ii - Declaration
	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 3.2
	a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant;	Section 3
	a description of the mean density of observations/number of sample sites per unit area and the site inspection observations;	Section 7
	a description of the assumptions made and any uncertainties or gaps in knowledge or data;	Page i
	details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;	Section 7
	the online database name, hyperlink, and record accession numbers for disseminated evidence of SCC found within the study area;	Section 3.1 and Section 3.3 Section 6 showing data from the sources listed in Section 3.
	the location of areas not suitable for development and to be avoided during construction where relevant;	Section 8
	a discussion on the cumulative impacts;	Section 9.4.1.3
	Impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	Section 10
	a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not of the development and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and	Conclusion and Executive summary (last paragraph).
	a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above that were identified as having "low" or "medium" terrestrial animal species sensitivity and were not considered appropriate.	Section 8.1 and Section 8.2.
	3.2 A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Included in Environmental Documents as Appendix.
MEDIUM SENSITIVITY RATING – for terrestrial animal species:	Medium Sensitivity Species of Conservation Concern Confirmation Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 or is based on habitat suitability modelling.	**Sensitivity** / **Feature(s)** High / *Aves-Tyto capensis*

<table>
<tr>
<td rowspan="2">1. Suspected habitat for SCC based either on historical records (prior to 2002) or being a natural area included in a habitat suitability model for this species.
2. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.</td>
<td>The presence or likely presence of the SCC identified by the screening tool must be investigated through a site inspection by a specialist registered with the SACNASP with a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.

The assessment must be undertaken within the study area.

The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guidelines.

The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC identified within the site identified as "medium" sensitivity by the screening tool.</td>
<td>
<table>
<tr><td>Medium</td><td>Aves-Tyto capensis</td></tr>
<tr><td>Medium</td><td>Aves-Hydroprogne caspia</td></tr>
<tr><td>Medium</td><td>Aves-Sagittarius serpentarius</td></tr>
<tr><td>Medium</td><td>Aves-Eupodotis senegalensis</td></tr>
<tr><td>Medium</td><td>Mammalia-Crocidura maquassiensis</td></tr>
<tr><td>Medium</td><td>Mammalia-Dasymys robertsii</td></tr>
<tr><td>Medium</td><td>Mammalia-Hydrictis maculicollis</td></tr>
<tr><td>Medium</td><td>Mammalia-Ourebia ourebi ourebi</td></tr>
</table>

The footprints are generally not on natural terrain and within either the mine fenced areas or agricultural areas. Natural vegetation will be cleared and specifically sections where the river diversion is proposed remains natural habitat that will be impacted by the development.</td>
</tr>
<tr>
<td>Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Animal Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol.

Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Animal Species Compliance Statement must be submitted.</td>
<td>This report.</td>
</tr>
<tr>
<td>LOW SENSITIVITY RATING – for terrestrial animal species:

Areas where no natural habitat remains.
Natural areas where there is no suspected occurrence of SCC.</td>
<td>Terrestrial Animal Species Compliance Statement

The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science or Ecological Science).
a) The compliance statement must: be applicable to the study area;
b) confirm that the study area, is of "low" sensitivity for terrestrial animal species; and indicate whether or not the proposed development will have any impact on SCC.

The compliance statement must contain, as a minimum, the following information:
1. Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae.
2. a signed statement of independence by the specialist;
3. a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
4. a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;
5. the mean density of observations/ number of samples sites per unit area15.</td>
<td>Compliance Statement for Low sensitivity not completed since Screening Report indicated possible sensitivities and SCC found on site.

High sensitivity awarded after field assessment conducted for certain areas delineated.</td>
</tr>
</table>

	6. where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr; 7. a description of the assumptions made and any uncertainties or gaps in knowledge or data; and 8. any conditions to which the compliance statement is subjected. 9. 6. A signed copy of the Terrestrial Animal Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	

4.11.1.2 Terrestrial Plant Species

Table 5: GN 1150 (Notice No 43855) of 30 October 2020

ASSESSMENT AND REPORTING OF IMPACTS ON TERRESTRIAL PLANT SPECIES		
Requirements		**Sections**
General Information An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "very high" or "high" sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Specialist Assessment Report. An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "medium sensitivity" for terrestrial plant species, must submit either a Terrestrial Plant Species Specialist Assessment Report or a Terrestrial Plant Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4. An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of "low" sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Compliance Statement. Where the information gathered from the site sensitivity verification differs from the screening tool designation of "very high" or "high" for terrestrial plant species sensitivity on the screening tool, and it is found to be of a "low" sensitivity, then a Terrestrial Plant Species Compliance Statement must be submitted. Where the information gathered from the site sensitivity verification differs from the screening tool designation of "low" terrestrial plant species sensitivity and it is found to be of a "very high" or "high" terrestrial plant species sensitivity, a Terrestrial Plant Species Specialist Assessment must be conducted. If any part of the development falls within an area of confirmed "very high" or "high" sensitivity, the assessment and reporting requirements prescribed for the "very high" or "high" sensitivity, apply to the entire development footprint. Development footprint in the context of this protocol, means the area on which the proposed development will take place and includes the area that will be disturbed or impacted. The Terrestrial Plant Species Specialist Assessment and the Terrestrial Plant Species Compliance Statement must be undertaken within the study area.		This Report. No Compliance statement is utilised – a full impact assessment report had been conducted. A Specialist Report was required as sections of High sensitivity overlap with the specific area and footprint in terms of Terrestrial Biodiversity. High sensitivity was awarded based on the field assessment findings.
Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site. Where the nature of the activity is expected to have an impact on SCC beyond boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline18, and the study area must include the PAOI, as determined.		Section 8.1, Section 8.2 and Section 8.3
VERY HIGH SENSITIVITY RATING – for terrestrial plant species:	Terrestrial Plant Species Specialist Assessment: The assessment must be undertaken by a specialist registered with the South African Council for Natural Scientific Professions (SACNASP), within a field of practice relevant to the taxonomic groups ("taxa") for which the assessment is being undertaken.	Page i and Page ii of the report and Appendix D
	The assessment must be undertaken within the study area.	Done

Critical Habitat for range restricted species of conservation concern that have a global range of less than 10 km^2. SCC listed on the IUCN Red List of Threatened Species or on South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria or listed as Nationally Rare Species aggregations that represent ≥1% of the global population size of a species, over a season, and during one or more key stages of its life cycle. The number of mature individuals that ranks the site among the largest 10 aggregations known for the species. These areas are irreplaceable in terms of SCC.	The assessment must be undertaken in accordance with the Species Environmental Assessment Guideline and must: Identify the SCC which were found, observed or are likely to occur within the study area;	Of the 125 species previously recorded for the area, two are Species of Conservation Concern (SCC) in terms of their Red List status. Four additional flora species were listed for the project area in the Environmental Screening Tool Report. Of these SCC, only two have moderate likelihood of occurrence.
	Provide evidence (photographs) of each SCC found or observed within the study area, which must be disseminated by the specialist to a recognized online database facility immediately after the site inspection has been performed (prior to preparing the report contemplated in paragraph 3);	The baseline data recorded SCC in the area, and these are provided in Section 6.
	Identify the distribution, location, viability, and detailed description of population size of the SCC identified within the study area;	Section 6 where applicable
	identify the nature and the extent of the potential impact of the proposed development to the population of the SCC located within the study area;	Section 8, Section 9 and Section 10
	Determine the importance of the conservation of the population of the SCC identified within the study area, based on information available in national and international databases including the IUCN Red List of Threatened Species, South African Red List of Species, and/or other relevant databases;	Section 6 where applicable. Also refer to Section 8
	Determine the potential impact of the proposed development on the habitat of the SCC located within the study area;	Section 9. Impact on habitat has been included and assessed
	Include a review of relevant literature on the population size of the SCC, the conservation interventions as well as any national or provincial species management plans for the SCC. This review must provide information on the need to conserve the SCC and indicate whether the development is compliant with the applicable species management plans and if not, a motivation for the deviation;	Section 6 where applicable. If any SCC has been found, it has been described in Section 7.
	Identify any dynamic ecological processes occurring within the broader landscape, that might be disrupted by the development and result in negative impact on the identified SCC, for example, fires in fire-prone systems;	Grassland is an important ecological feature, but has been transformed. However, it is a fire prone system, specifically during periods of drought.
	Identify any potential impact on ecological connectivity within the broader landscape, and resulting impacts on the identified SCC and its long-term viability;	The site does not have specific increased value in terms of migration, pollination or other. The riverine and drainage features in the area could potentially be valued as an ecological corridor, however, these do not intercept with the footprints.
	Determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC; and	Section 8 – No specific buffer distances is applicable. No SCC were identified to occur on the project footprint during the site survey. However, six flora SCC were identified for the project area during the desktop assessment, of which two were considered to be moderately likely to occur on the project footprint, specifically in the riparian and wetland habitats (VU3).

<table>
<tr><td></td><td>discuss the presence or likelihood of additional SCC including threatened species not identified by the screening tool, Data Deficient or Near Threatened Species, as well as any undescribed species; and</td><td>Section 6 where applicable. Refer to Section 7. No floral SCC were identified to occur on the project footprint during the site survey.</td></tr>
<tr><td></td><td>identify any alternative development footprints within the preferred development site which would be of “low” sensitivity” or “medium” sensitivity as identified by the screening tool and verified through the site sensitivity verification.</td><td>Section 8</td></tr>
<tr><td rowspan="14">HIGH SENSITIVITY RATING – for terrestrial plant species:
1. Confirmed habitat for SCC.
2. SCC listed on the IUCN Red List of Threatened Species or South Africa’s National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria.

These areas are unsuitable for development due to a very likely impact on SCC.</td><td>2.4 The findings of the assessment must be written up in a Terrestrial Plant Species Specialist Assessment Report.

Terrestrial Plant Species Specialist Assessment Report:

This report must include as a minimum the following information:
contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae;</td><td>This report provides all the details and all CVs of applicable parties have been provided as an Appendix as well.</td></tr>
<tr><td>a signed statement of independence by the specialist;</td><td>Page i and Page ii of the report and Appendix D</td></tr>
<tr><td>a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;</td><td>Page ii - Declaration</td></tr>
<tr><td>a description of the methodology used to undertake the site sensitivity verification and impact assessment and site inspection, including equipment and modelling used where relevant;</td><td>Section 3.2</td></tr>
<tr><td>a description of the assumptions made and any uncertainties or gaps in knowledge or data;</td><td>Section 3</td></tr>
<tr><td>a description of the mean density of observations/number of samples sites per unit area28 of site inspection observations;</td><td>Section 7</td></tr>
<tr><td>details of all SCC found or suspected to occur on site, ensuring sensitive species are appropriately reported;</td><td>Page i</td></tr>
<tr><td>the online database name, hyperlink and record accession numbers for disseminated evidence of SCC found within the study area;</td><td>Section 7</td></tr>
<tr><td>the location of areas not suitable for development and to be avoided during construction where relevant;</td><td>Section 3.1 and Section 3.3
Section 6 showing data from the sources listed in Section 3</td></tr>
<tr><td>a discussion on the cumulative impacts;</td><td>Section 8</td></tr>
<tr><td>impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);</td><td>Section 9.4.1.3</td></tr>
<tr><td>a reasoned opinion, based on the findings of the specialist assessment, regarding the acceptability or not, of the development related to the specific theme considered, and if the development should receive approval or not, related to the specific theme being considered, and any conditions to which the opinion is subjected if relevant; and</td><td>Section 10</td></tr>
<tr><td>a motivation must be provided if there were any development footprints identified as per paragraph 2.3.12 above that were identified as having “low” or “medium” terrestrial plant species sensitivity and were not considered appropriate.</td><td>Conclusion and Executive summary (last paragraph)</td></tr>
<tr><td>3.2 A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.</td><td>This report – signed in Declaration – Page ii</td></tr>
<tr><td>MEDIUM SENSITIVITY RATING – for terrestrial plant species:

Suspected habitat for SCC based either on there being records for this species collected in the past, prior to 2002,</td><td>Medium Sensitivity Species of Conservation Concern Confirmation.

Medium sensitivity data represents suspected habitat for SCC based on occurrence records for these species collected prior to 2002 and/or is based on habitat suitability modelling.

The presence or likely presence of the SCC identified by the screening tool, must be confirmed through a site inspection by a specialist registered with the SACNASP in a field of practice relevant to the taxonomic group (“taxa”) for which the assessment is being undertaken.

The assessment must be undertaken within the study area.</td><td><table><tr><th>Sensitivity</th><th>Feature(s)</th></tr><tr><td>Low</td><td>Low Sensitivity</td></tr><tr><td>Medium</td><td>Sensitive species 41</td></tr><tr><td>Medium</td><td>Sensitive species 691</td></tr><tr><td>Medium</td><td>Pachycarpus suaveolens</td></tr><tr><td>Medium</td><td>Brachycorythis conica subsp. transvaalensis</td></tr></table></td></tr>
</table>

or being a natural area included in a habitat suitability model. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.	The site inspection to determine the presence or likely presence of SCC must be undertaken in accordance with the Species Environmental Assessment Guideline30. The site inspection is to confirm the presence, likely presence or confirmed absence of a SCC within the site identified as "medium" sensitivity by the screening tool. Where SCC are found on site or have been confirmed to be likely present, a Terrestrial Plant Species Specialist Assessment must be submitted in accordance with the requirements specified for "very high" and "high" sensitivity in this protocol. Similarly, where no SCC are found on site during the investigation or if the presence is confirmed to be unlikely, a Terrestrial Plant Species Compliance Statement must be submitted.	
LOW SENSITIVITY RATING – for terrestrial plant species: Areas where no natural habitat remains. Natural areas where there is no suspected occurrence of SCC.	Terrestrial Plant Species Compliance Statement: The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science). The compliance statement must: • be applicable within the study area; • confirm that the study area is of "low" sensitivity for terrestrial plant species; and indicate whether or not the proposed development will have any impact on SCC. The compliance statement must contain, as a minimum, the following information: • contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae; • a signed statement of independence by the specialist; • a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment; • a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant; • where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr; • a description of the assumptions made and any uncertainties or gaps in knowledge or data; • the mean density of observations/ number of samples sites per unit area; and • any conditions to which the compliance statement is subjected. A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.	Compliance Statement for Low sensitivity not completed since Screening Report indicated possible sensitivities and this was assessed in the field. High sensitivity has been awarded based to riparian and wetland habitats.

PROJECT AND STUDY AREA CHARACTERISTICS

5 OVERVIEW OF STUDY AREA

5.1 Locality of Proposed Activities

The project is situated in the Mpumalanga province of South Africa, which is governed locally by the Emalahleni Local Municipality and regionally by the Nkangala District Municipality. The closest town to the project is Kriel (approximately 11 km southwest of the 2 Seam Mine). The R547 provincial road provides access to the town.

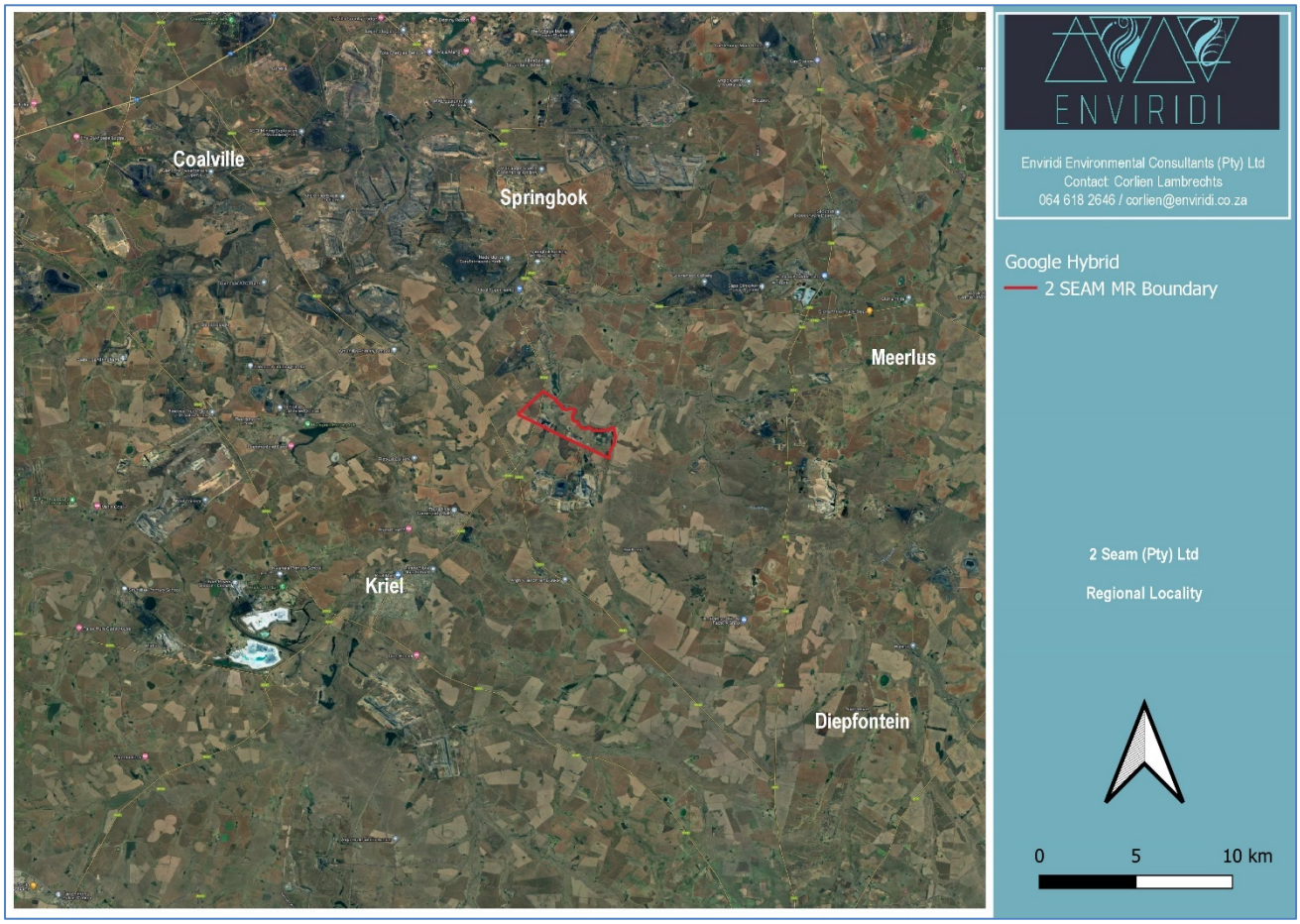

Figure 1: Regional Locality in the Mpumalanga Province

5.2 Activity Description

2 Seam is an existing opencast coal mine, consisting of the original 2 Seam Mine Blocks OC1, OC2, OC2A, OC4, OC5 and OC6. The 2 Seam Mine Block OC6 and Block OC06A project fall within the footprint of historical underground mining operation known as Transvaal Navigation Colliery (TNC). 2 Seam has existing Run of Mine (RoM) stockpile areas located on rehabilitated opencast areas. 2 Seam holds one mining right (Mining Right (MP) 30/5/1/2/3/2/1 (405) EM). It produces coal for the local market.

The roll over strip mining method is utilised to extract coal. The existing opencast operations have an approximate extent of 257 ha (some of this area has already been mined and other areas are currently being mined in accordance with the previous approved mine plan) while the applicant wishes to authorise an additional 11 ha of opencast mining.

2 Seam is planning to add additional opencast mining areas (i.e., OC04A and OC04B) within the existing mining right areas to extend the Life-of-Mine (LoM). As such an MPRDA S102 amendment process is being undertaken by the mine, supported by the integrated EIA/WML

and WULA applications. The EIA process will result in a consolidation of the numerous authorisation processes that have been undertaken to date to produce a single overarching EMPr for holistic management of the 2 Seam Mine going forward.

2 Seam Mine will be applying for the relevant approvals to cover their extended LoM which will include future opencast and associated infrastructure. Various amendments to the existing EA/EMP as well as IWUL will also be applied for to align the specific conditions with the current status of the mine as well as to provide more clarity on certain conditions. Furthermore 2 Seam will be applying for a coal washing plant and tailings facility on site, associated stormwater management infrastructure (PCDs and clean and dirty water berms) and a contractor's yard.

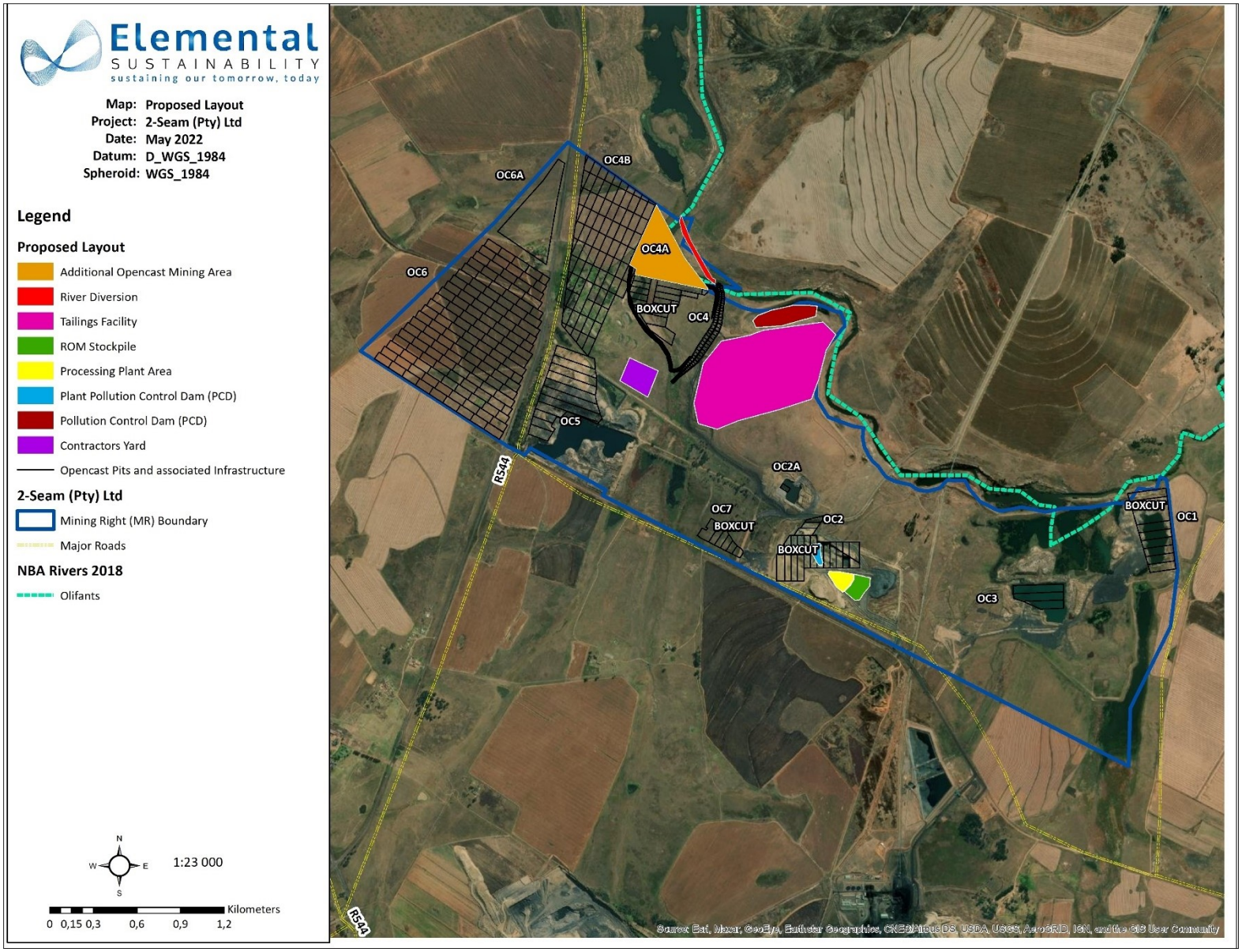

Figure 2: Layouts proposed for the 2 Seam Mine (provided by EAP)

The development falls within the 2629AB QDS feature, which has been included within this report.

Information on plant species recorded for the Quarter Degree Squares (QDS) was extracted from the POSA online database hosted by SANBI. A list of plant species that have a high probability of occurring in the relevant QDS(s) is provided in Appendix B: POSA FLORA SPECIES LIST FOR QDS.

Figure 3: Quarter Degree Squares (QDS) – 2629AB

5.3 Biome

According to the National Vegetation Map (SANBI 2006 – 2018) the project area is located in the Grassland biome.

Grassland is the second largest biome in South Africa, covering 28.4% of the country or more than 360 000 km^2. Grassland is found in summer rainfall areas, from sea level to above 2000 m. Most of South Africa's grasslands are found in highveld areas that experience frost in winter.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. Trees are absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Grassland burns regularly (often every year) and the flora of the biome is therefore adapted to the fire regime. Because fires are frequent, there are very few woody plants like trees (mainly in river courses and on rocky slopes).

The Grassland Biome is considered to have an extremely high biodiversity, with nearly 3800 plant species recorded, second only to the Fynbos Biome.

5.4 Broad Vegetation Description (Vegetation Map 2018)

One vegetation type, according to the National Vegetation Map (SANBI, 2006 – 2018), occurs in the project area, namely Eastern Highveld Grassland (Gm12).

The Eastern Highveld Grassland vegetation type is located in the Mpumalanga and Gauteng Provinces. The vegetation type is distributed on lightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Senegalia caffra*, *Celtis africana*, *Diospyros lycioides* subsp. *lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Searsia magalismontanum*).

A list of expected common and dominant species in undisturbed vegetation includes the following (those with a "d" are considered to be dominant) (Mucina and Rutherford, 2006):

- **Graminoids:** *Aristida aequiglumis* (d), *A. congesta* (d), *A. junciformis* subsp. *galpinii* (d), *Brachiaria serrata* (d), *Cynodon dactylon* (d), *Digitaria monodactyla* (d), *D. tricholaenoides* (d), *Elionurus muticus* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. plana* (d), *E. racemosa* (d), *E. sclerantha* (d), *Heteropogon contortus* (d), *Loudetia simplex* (d), *Microchloa caffra* (d), *Monocymbium ceresiiforme* (d), *Setaria sphacelata* (d), *Sporobolus africanus* (d), *S. pectinatus* (d), *Themeda triandra* (d), *Trachypogon spicatus* (d), *Tristachya leucothrix* (d), *T. rehmannii* (d), *Alloteropsis semialata* subsp. *eckloniana*, *Andropogon appendiculatus*, *A. schirensis*, *Bewsia biflora*, *Ctenium concinnum*, *Diheteropogon amplectens*, *Eragrostis capensis*, *E. gummiflua*, *E. patentissima*, *Harpochloa falx*, *Panicum natalense*, *Rendlia altera*, *Schizachyrium sanguineum*, *Setaria nigrirostris*, *Urelytrum agropyroides*.
- **Herbs:** *Berkheya setifera* (d), *Haplocarpha scaposa* (d), *Justicia anagalloides* (d), *Pelargonium luridum* (d), *Acalypha angustata*, *Chamaecrista mimosoides*, *Dicoma anomala*, *Euryops gilfillanii, E. transvaalensis* subsp. *setilobus, Helichrysum aureonitens*, *H. caespititium*, *H. callicomum*, *H. oreophilum*, *H. rugulosum*, *Ipomoea crassipes*, *Pentanisia prunelloides* subsp. *latifolia*, *Selago densiflora*, *Senecio coronatus*, *Vernonia oligocephala*, *Wahlenbergia undulata, Gladiolus crassifolius*, *Haemanthus humilis* subsp. *hirsutus*, *Hypoxis rigidula* var. *pilosissima*, *Ledebouria ovatifolia, ecklonis*.
- **Shrubs:** *Anthospermum rigidum* subsp. *pumilum*, *Stoebe plumosa*.

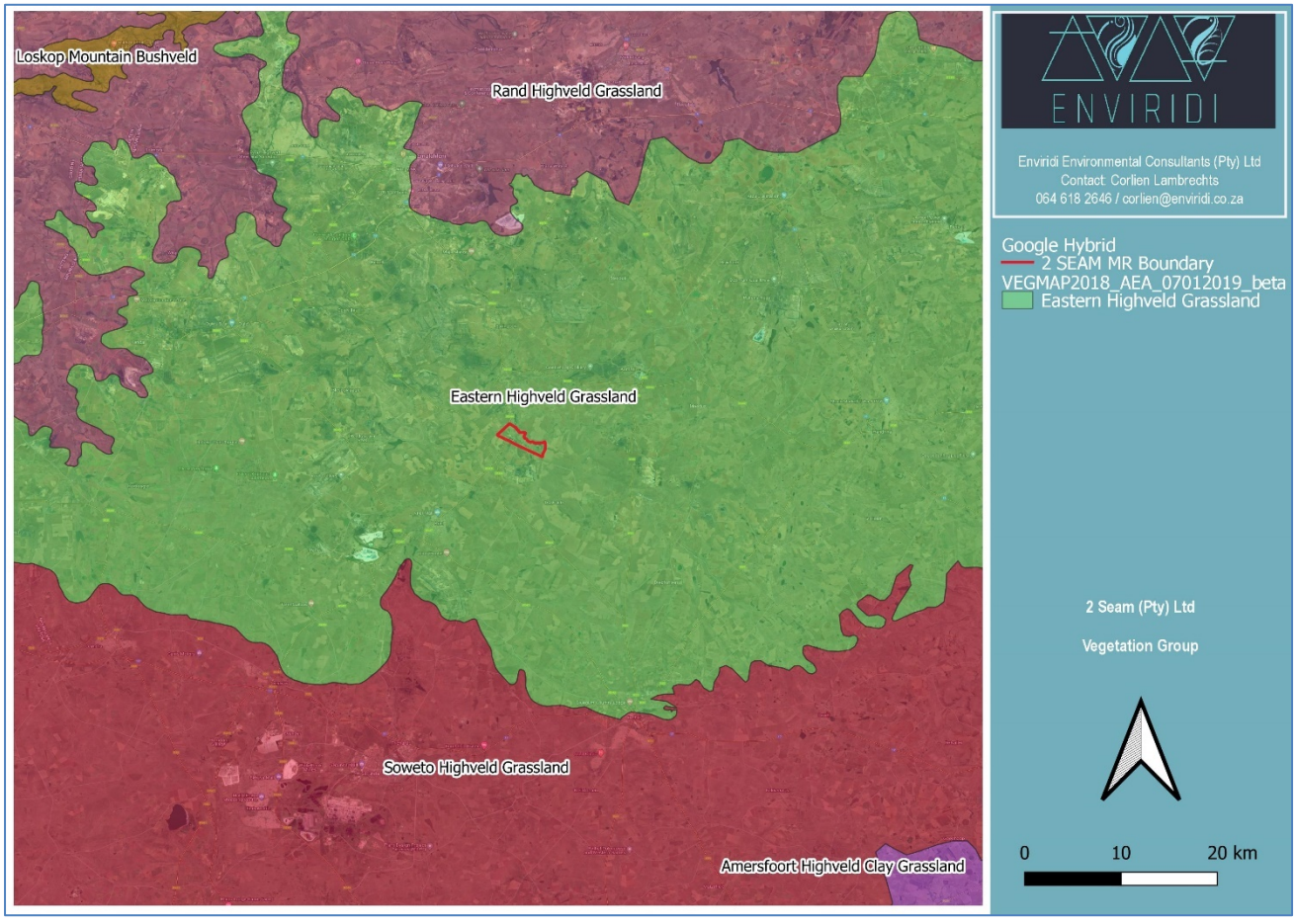

Figure 4: Vegetation Group for the 2 SEAM Project

5.4.1 Vegetation Conservation Status

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under NEMBA (Section 3.1.1), lists national vegetation types that are afforded protection on the basis of rates of transformation. The thresholds for listing in this legislation are higher than in the scientific literature, which means there are fewer ecosystems listed in the National Ecosystem List versus in the scientific literature.

Eastern Highveld Grassland is shown as Vulnerable and in the "National List of Ecosystems that are Threatened and need of protection", which is also reflected by the 2018 National Biodiversity Assessment.

METHODOLOGY, DATA GATHERED AND ANALYSIS

6 DESKTOP ASSESSMENT

6.1 Site Characteristics and Status

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under NEMBA (Section 3.1.1), lists national vegetation types that are afforded protection on the basis of rates of transformation. The Eastern Highveld Grassland as Vulnerable and in the "National List of Ecosystems that are Threatened and need of protection", which is also reflected by the 2018 National Biodiversity Assessment.

There is one main conservation management plan for the province, namely the Mpumalanga Biodiversity Sector Plan (MBSP). The MBSP comprises two spatial components: maps of terrestrial and freshwater critical biodiversity areas (CBAs); and a set of land-use guidelines that are important for maintaining and supporting the inherent biodiversity values of these critical biodiversity areas.

Protection of the priority areas identified in the MBSP would contribute (on a proportional basis to ecosystem extent in Mpumalanga Province) to meeting national biodiversity targets for the South African vegetation types.

Table 6: MBSP biodiversity categories description

MBSP Biodiversity Category	Description
Critical Biodiversity Areas (CBAs)	Critical Biodiversity Areas are those areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. They should remain in a natural state that is maintained in good ecological condition. CBAs are areas of high biodiversity value, but are often also at risk of being lost through biodiversity-incompatible land-use practices. CBAs include, inter alia, Critically Endangered Ecosystems and critical linkages (corridor pinch-points) to maintain connectivity.
Ecological Support Areas (ESAs)	Ecological support areas are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of critical biodiversity areas or for generating or delivering important ecosystem services. They support landscape connectivity and resilience to climate change adaptation. ESAs need to be maintained in at least an ecologically functional state.
Other Natural Areas (ONA)	These are natural areas that have not been selected to meet biodiversity pattern or ecosystem process targets, or to support the functioning of Critical Biodiversity Areas. Despite this, they are not without 'value'. ONAs often retain much of their natural character and may contribute significantly to maintenance of viable species populations and natural ecosystem functioning, and may provide important ecological infrastructure and ecosystem services. They are not, however, prioritized for immediate conservation action in the MBSP, unless CBAs or ESAs are lost, or impacting activities within the ONAs impact negatively on other areas.
Modified ('Transformed')	Modified areas (often called 'transformed' areas in other literature, including the MBCP) are those which have lost a significant proportion (or all) of their natural biodiversity and in which ecological processes have broken down (in some cases irretrievably), as a result of biodiversity-incompatible land-use practices such as ploughing, hardening of surfaces, mining, cultivation and the construction of houses or other built infrastructure. Even so, these areas may include small fragments of natural habitat such as the patches or strips of natural vegetation that survive between planted fields or the small, natural open spaces in towns. These disconnected fragments are often biologically impoverished, highly vulnerable to damage and have limited likelihood of being able to persist, though they may retain some residual biodiversity value and ecological function. They are not generally considered a priority for conservation action unless they contain unique features that demand it.

The study area contains the following biodiversity classes from the MBSP:

- Modified ('Transformed'): The majority of the project footprint is located on areas categorised as Modified. The Modified areas are located in areas which have been transformed by current and historic mining activities as possible crop cultivation prior to mining. Based on the findings of the site survey, the specialist determined that these areas should be considered as Modified.

- Other Natural Areas (ONA): Sections of the proposed project footprint are located in areas categorised as ONA. Based on the findings of the site survey some of the areas categorised as ONA, would be more accurately designated as Modified, due to existing mining activities and crop cultivation. Refer to Vegetation Units as depicted in Figure 5.

No protected areas, in terms of NEMPAA, are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km of the proposed road route.

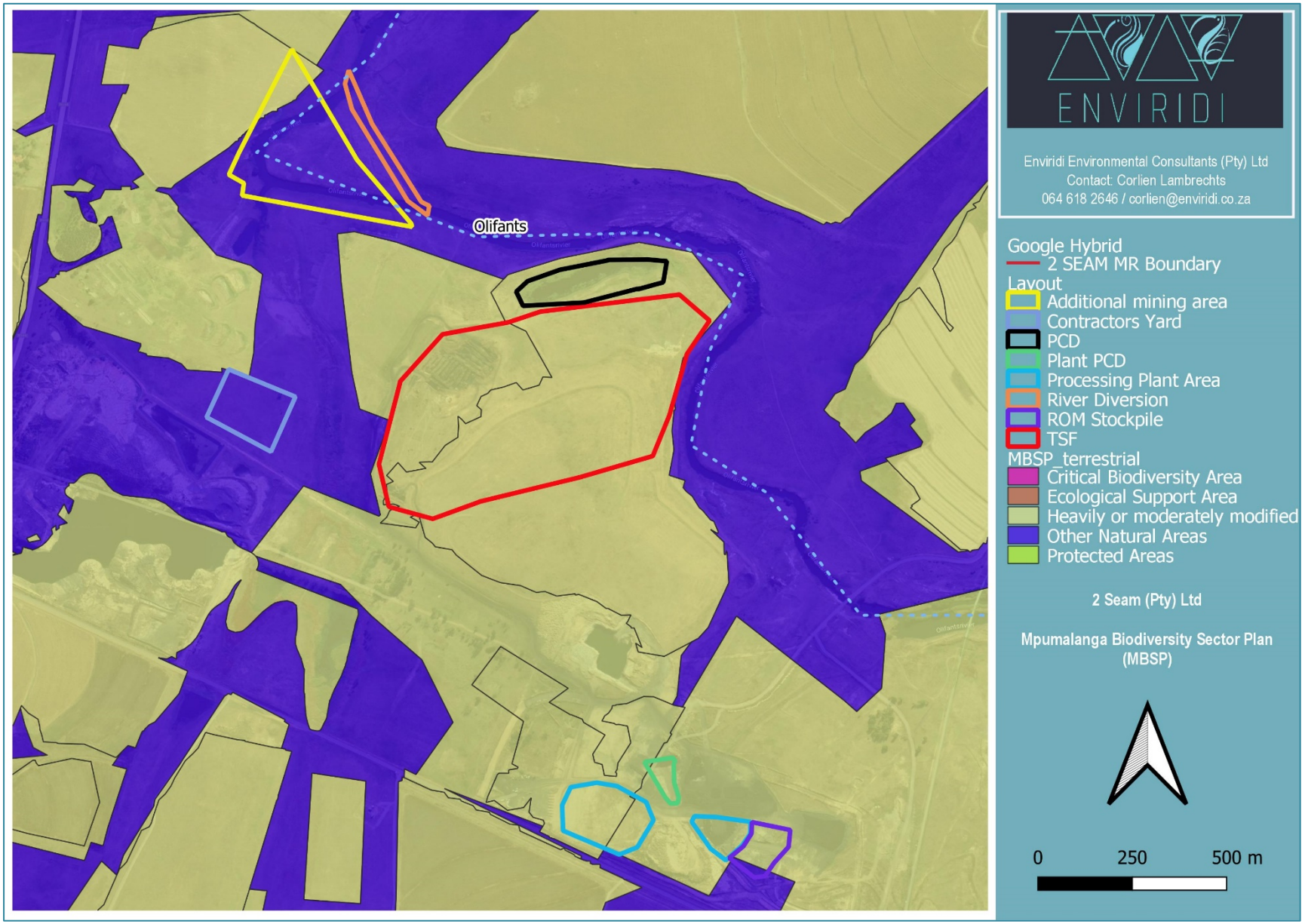

Figure 5: Mpumalanga Conservation Plan (Terrestrial Biodiversity Assessment in terms of MBSP)

6.2 Flora Assessment and Species lists compiled – POSA Species lists

Information on plant species previously recorded for the project area was extracted from the POSA online database hosted by SANBI. A list of plant species that have previously been recorded in the project area is provided in Appendix B. The results indicate that 125 plant species have been recorded in the area queried, consisting of 37 families. The most prominent family is Cyperaceae, with 28 species, followed by Asteraceae and Poaceae, with 11 species each.

Of the 125 species previously recorded for the area, two are Species of Conservation Concern (SCC) in terms of their Red List status. Four additional flora species were listed for the project area in the Environmental Screening Tool Report. The table below lists the SCC which may potentially occur on the project footprint. It should be noted that though none of these species were identified during the site survey, their likelihood of occurrence, in the specialist's opinion, is provided in the table below.

Table 7: Flora SCC listed for the project area

Species	Red List Status	Occurrence
Argyrolobium longifolium	Vulnerable	Unlikely to occur
Khadia carolinensis	Vulnerable	Unlikely to occur
Sensitive species 41	Vulnerable	Moderate likelihood of occurrence (associated with wetlands)
Sensitive species 691	Vulnerable	Moderate likelihood of occurrence (associated with wetlands)
Pachycarpus suaveolens	Vulnerable	Unlikely to occur
Brachycorythis conica subsp. *transvaalensis*	Critically Endangered	Low likelihood of occurrence

Five (5) flora species recorded on POSA for the area are listed as protected in the MNCA, i.e. *Ceropegia rehmannii, Disa woodii, Gladiolus elliotii, Gladiolus papilio* and *Orthochilus leontoglossus.*

Three (3) species were found to possibly occur on site that have medicinal uses, i.e. H*elichrysum nudifolium, Pellaea calomelanos* and *Searsia dentata.*

Nine (9) of the flora species recorded on POSA for the area are endemic to South Africa (refer to Appendix B).

None of the flora species recorded on POSA for the project area are protected in terms of the NFA or the ToPs list.

Ten (10) exotic plant species were recorded to occur within the area queried, none of which are listed as an AIP species in terms of the NEMBA.

6.3 Fauna Assessment and Species lists compiled

A desktop study was conducted to establish whether any potentially sensitive faunal species or species of conservation concern may possibly occur on site. The Virtual Museum and Animal Demography Unit (ADU) were used to compile species lists based on the sightings and data gathering from the South African Biodiversity Institute for the 2629AB QDS. The avifaunal species list was obtained from SABAP2 for the 2605_2920, 2605_2915 and 2610_2920 pentad.

It is important to note that a QDS covers a large area: ±27 X 25 km (±693 km²) and a pentad (SABAP2 Protocol) an area of ±8 X 7.6 km (±60.8 km²), it is possible that suitable habitat will exist for a certain Red Data avifaunal species within this wider area surrounding the study site. However, the specific habitat(s) found on site may not suit Red Data species, even though it has been recorded for the QDS or pentad.

Species and habitat were identified as possibly sensitive within the framework of this study. Sensitive species were determined according to their close relationship and dependence on the vegetation type and habitat found to occur.

Appendix C list the faunal species for the 2629AB QDS and Table 8 lists all fauna species that are of conservation concern which were found during the desktop study. Only mammalian and avifaunal species with a red listed status are known to occur where the new 2 Seam Infrastructure are proposed.

Table 8: Fauna SCC found in 2629AB QDS that may be relevant to the 2 Seam development

Species	Common name	Conservation status
Mammalian species		
Crocidura maquassiensis	Makwassie musk shrew	Vulnerable (2016) - As per Screening Tool Report
Dasymys robertsii	Robert's Marsh Rat	Near Threatened (2016)- As per Screening Tool Report
Ourebia ourebi	Oribi	Endangered, ToPS EN, MNCA Schedule 2
Felis nigripes	Black-footed Cat	Vulnerable (2016)
Leptailurus serval	Serval	Near Threatened (2016), MNCA Schedule 5
Otomys auratus	Southern African Vlei Rat (Grassland type)	Near Threatened (2016)
Hydrictis maculicollis	Spotted-necked Otter	Vulnerable, MNCA Schedule 2
Crocidura mariquensis	Swamp Musk Shrew	Near Threatened (2016)
Avifaunal species		
Sagittarius serpentarius	Secretarybird	VU (Regional), EN (Global) - Screening Tool Report
Oxyura maccoa	Duck, Maccoa	NT (Regional), VU (Global)
Phoenicopterus roseus	Flamingo, Greater	NT (Regional), LC (Global)
Eupodotis caerulescens	Korhaan, Blue	LC (Regional), NT (Global)
Geronticus calvus	Ibis, Southern Bald	VU (Regional), VU (Global)
(Tyto capensis	Owl, African Grass	VU (Regional), LC (Global) - Screening Tool Report
Glareola nordmanni	Pratincole, Black-winged	NT (Regional), NT (Global)
Calidris ferruginea	Sandpiper, Curlew	LC (Regional), NT (Global)
Coracias garrulus	Roller, European	NT (Regional), LC (Global)
Sterna caspia	Tern, Caspian	VU (Regional), LC (Global) - Screening Tool Report
Eupodotis senegalensis	Korhaan, White-bellied	VU (Regional), LC (Global) - Screening Tool Report

6.3.1 Mammals

Thirteen (13) mammal species were found to possibly occur within the QDS and three (3) additional species flagged by Screening Tool Report. Eight (8) species are included within the National Red Data List:

- *Crocidura maquassiensis* - Makwassie musk shrew - VU (2016) - As per Screening Tool Report
- *Dasymys robertsii* - Robert's Marsh Rat - NT (2016)- As per Screening Tool Report
- *Ourebia ourebi* - Oribi - EN, ToPS EN, MNCA Schedule 2
- *Felis nigripes* - Black-footed Cat - VU (2016)
- *Leptailurus serval* - Serval - NT (2016), MNCA Schedule 5, TOPS Protected
- *Otomys auratus* - Southern African Vlei Rat (Grassland type) - NT (2016)
- *Hydrictis maculicollis* - Spotted-necked Otter - VU (2016), MNCA Schedule 2, TOPS Protected
- *Crocidura mariquensis* - Swamp Musk Shrew - NT (2016)

6.3.2 Avifaunal

According to data collected during the Southern African Bird Atlas Project 2 (SABAP2) http://sabap2.adu.org.za, the site is located within pentad 2605_2920, 2605_2915 and 2610_2920 and one hundred and seventy-one (171) bird species listed for this area. Nine (9) avifaunal SCC have been indicated for the specific pentad relevant to the development and two (2) additional SCC flagged in the Screening Tool Report.

- Secretarybird (*Sagittarius serpentarius*) - VU (Regional), EN (Global) - Screening Tool Report
- Duck, Maccoa (*Oxyura maccoa*) - NT (Regional), VU (Global)
- Flamingo, Greater (*Phoenicopterus roseus*) - NT (Regional), LC (Global)
- Korhaan, Blue (*Eupodotis caerulescens)* - LC (Regional), NT (Global), TOPS VU
- Ibis, Southern Bald (*Geronticus calvus*) - VU (Regional), VU (Global), TOPS VU
- Owl, African Grass (*Tyto capensis*) - VU (Regional), LC (Global) - Screening Tool Report, TOPS VU
- Pratincole, Black-winged (*Glareola nordmanni*)- NT (Regional), NT (Global)
- Sandpiper, Curlew (*Calidris ferruginea*) - LC (Regional), NT (Global)

- Roller, European (*Coracias garrulus*) - NT (Regional), LC (Global)
- Tern, Caspian (*Sterna caspia)* - VU (Regional), LC (Global) - Screening Tool Report
- Korhaan, White-bellied (Eupodotis senegalensis) - VU (Regional), LC (Global) - Screening Tool Report

The Amersfoort-Bethal-Carolina IBA is located approximately 30 km to the south east of the project area.

6.3.3 Butterflies

Seven (7) butterfly species were found for the 2629AB, all of which are categorized as Least Concern by SANBI (Appendix C).

6.3.4 Other Invertebrates

Four (4) Odonata species are known to occur within the area, all of which has a Least Concern rating.

6.3.5 Reptiles

Sixteen (16) reptile species are recorded for the QDS, the list of species that may possibly occur in the QDS are presented in Appendix C. None of the species have a red listed status.

6.3.6 Amphibians

Nine (9) amphibian species were listed within this QDS (Appendix C) and none of these species were red listed for the QDS.

7 SITE SURVEY RESULTS

7.1 Floral Assessment Results

A site survey was undertaken on the 2nd of August 2022.

The surface topography of the project area is slightly undulating with a general gradient of 3° to 10° towards the north-north-east. Surface elevation ranges between 1 530 m above mean sea level (mamsl) and 1 560 mamsl. The Olifants river flows along the northern border of the Mining Right area. Current and historical opencast mine workings and rehabilitated waste rock dumps affect the project site relief.

The project footprint is approximately 64 ha in extent.

The majority of the proposed project footprint (and extended 100 m project buffer) is located on land transformed for mining activities, with the remainder of the study site located on moderately to highly impacted grassland.

Land uses, on and adjacent to the project area, currently consist of mining and related activities, cropland, residences, and livestock grazing.

Vegetation units were identified according to plant species composition, previous land use and topography. The state of the vegetation of the proposed project area varies from being moderately impacted to completely transformed. The following broad classification of Vegetation Units (VU) were found to occur on the proposed project footprint and 100 m extended project area:

1. Impacted grassland (VU1);
2. Transformed land (VU2); and
3. Riparian and wetland (VU3).

The vegetation units, as identified during site visit, databases and aerial imagery are indicated in the figure below.

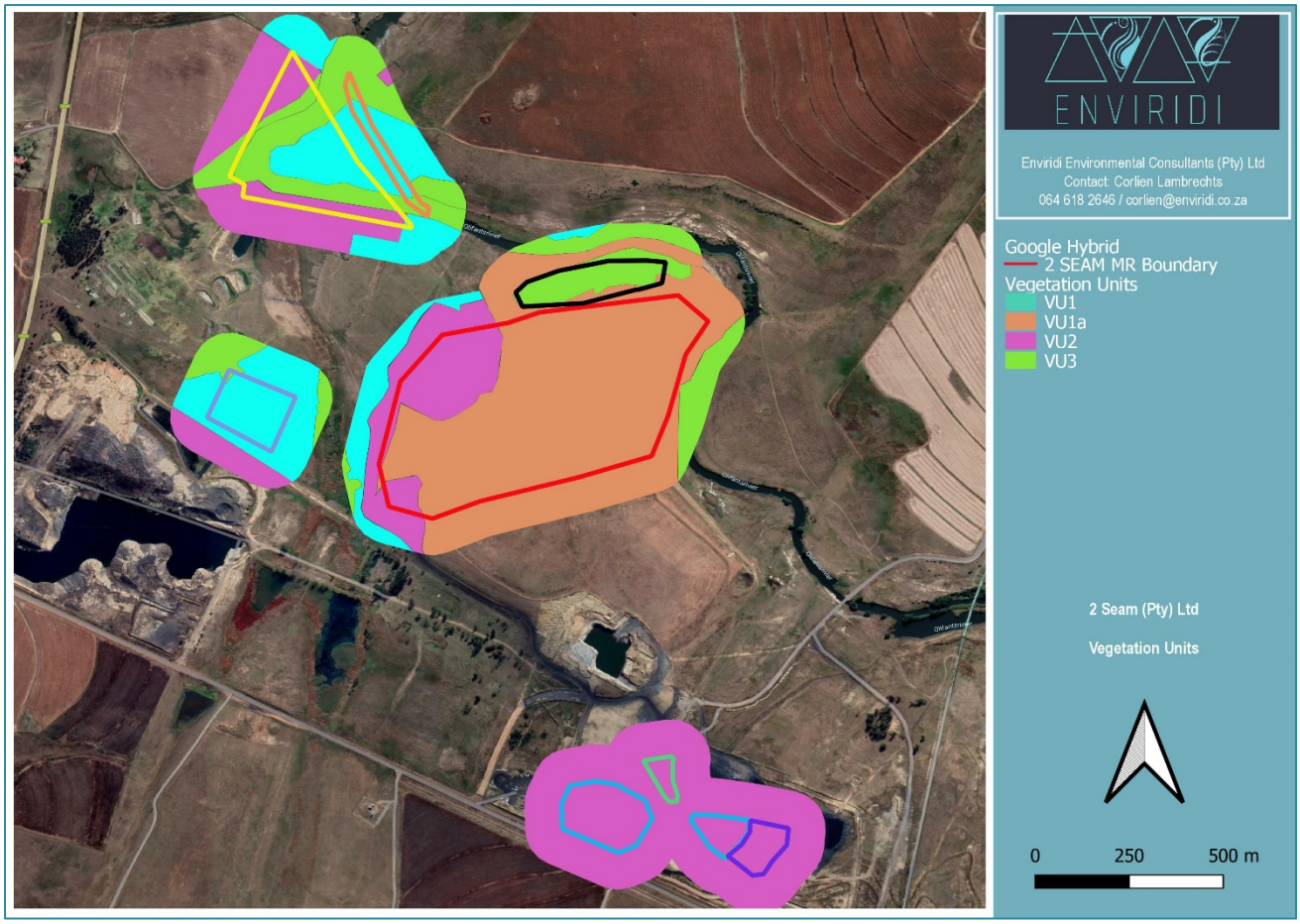

Figure 6: Vegetation Units Delineated

7.1.1 Vegetation Unit 1 (VU1)

Vegetation Unit 1 (VU1) is associated with grassland habitat and is 73 ha in extent. The grassland habitat is heavily modified by large-scale edge effects from mining activities, crop farming and grazing, which has resulted in an altered grassland habitat. Some areas of VU1 are likely to be old lands previously used for crop cultivation. 47.7 ha of VU1 is located on a rehabilitated waste rock dump (VU1a). VU1 is also impacted by exotic plant proliferation.

Most of VU1 has patches of wetland associated flora which is likely due to water runoff from roads and mining areas that has created moist conditions for obligate and facultative wetland species, such as *Cyperus denudatus* (Winged sedge), *Gomphocarpus rivularis, Helichrysum mundtii* (Strooiblom), *Imperata cylindrica* (Cottonwool grass) and *Scirpoides burkei* (Biesie).

Fourty-six (46) plant species were identified in VU1, of which 23 were grass species. The VU is dominated by grass species, with few trees and shrubs and low forb diversity. The dominant grass species include: *Cynodon dactylon* (Couch grass), *Eragrostis chloromelas* (Curly leaf), *E. curvula* (Weeping love grass), *E. rigidior* (Curly leaf), *E. trichophora* (Hairy love grass) and *Imperata cylindrica* (Cottonwool grass).

Eight exotic species were identified to occur within VU1, especially along road verges and moist grassland patches, of these eight species, three are classified as Alien and Invasive Plant (AIP) species in terms of the NEMBA, i.e. *Datura ferox* (Large thorn apple), *Solanum sisymbriifolium* (Dense-thorned bitter apple) and *Verbena bonariensis* (Purple top).

VU1 is considered to be heavily to moderately disturbed and the plant species composition of this VU is no longer considered representative of the Eastern Highveld Grassland vegetation type.

VU1 is located in areas categorised in the MBSP as Transformed and Other Natural Areas. However, some of the areas categorised as ONA, would be more accurately designated as Modified, due to existing mining activities and crop cultivation.

Due to the vegetation being very fragmented, moderately to highly impacted by current land-use and surrounding activities and that the vegetation composition is no longer representative of the Eastern Highveld Grassland, VU1 has been rated as having Low sensitivity.

Figure 7: Typical vegetation character of grassland (right) and moist grassland of VU1a (left)

7.1.2 Vegetation Unit 2 (VU2)

Vegetation Unit 2 occurs on the areas which have been totally transformed, i.e. current mining and associated activities and crop cultivation. This habitat is considered to have very low ecosystem service provision capabilities. 56 ha of the mining footprint and 100 m extended project area is located in VU2.

The vegetation unit is classified as having a low sensitivity due to the transformed state of the vegetation composition of the vegetation unit or lack of vegetation.

Figure 8: Mining activities (left) and cropland (right) of VU2 (VU2)

7.1.3 Vegetation Unit 3 (VU3)

VU3 is characterised by riparian and wetland vegetation associated with artificial impoundments, watercourses and the Olifants River. Twenty-three (23) ha of the project footprint and 100 m extended project buffer is located in VU3. It should be noted that VU3 is delineated only on the presence of obligate and facultative flora species.

VU3 is moderately to heavily modified by large-scale edge effects from mining activities, crop farming and grazing, which has resulted in an altered habitat. The VU was found to be highly fragmented by adjacent transformed vegetation and infrastructure. Vegetative cover in VU3 was found to be good with moderate species diversity.

Twenty-three (23) flora species were identified in VU3, most of which are obligate and facultative wetland species, such as *Cyperus articulatus* (Jointed flatsedge), *Cyperus fastigiatus*, *Gomphostigma virgatum* (River star), *Helichrysum mundtii* (Strooiblom), Imperata cylindrica (Cottonwool grass), Juncus articulatus, Phragmites australis (Common reed), *Pycreus polystachyos* and *Typha capensis* (Bulrush).

Six exotic species were identified to occur in within VU3, of these six species, three are classified as Alien and Invasive Plant (AIP) species in terms of the NEMBA, i.e. *Verbena bonariensis* (Purple top), *Cirsium vulgare* (Spear thistle) and *Datura stramonium* (Common thorn apple).

VU3 is located in areas categorised in the MBSP as Transformed and Other Natural Areas. However, some of the areas categorised as ONA, would be more accurately designated as Modified, due to existing mining activities and crop cultivation.

Although this VU is considered to be moderately to heavily disturbed, watercourses and wetlands are considered high sensitivity and are capable of providing suitable habitat for wetland species and flora SCC. No SCC were identified to occur on the project footprint during the site survey. However, two flora SCC are considered to be moderately likely to occur on the project footprint (refer to Figure 9), specifically in the riparian and wetland habitats.

Figure 9: Riparian and wetland habitats of VU3

7.1.4 Summary of floristic composition of the study area

A total of 62 plant species were recorded in the study area during the time of the study and indicates moderate species diversity, taking into consideration the transformed areas of VU2. 76% (48 of 62) of the recorded plant species are indigenous to South Africa. Fourteen (14) exotic species were recorded as occurring on the study area, of which six are listed as AIP in terms of the NEMBA.

From available literature it was established that at least three of the recorded plant species in the study area are to some extent used for medicinal purposes.

No SCC were identified to occur on the project footprint during the site survey. However, six flora SCC were identified for the project area during the desktop assessment, of which two were considered to be moderately likely to occur on the project footprint (refer to Table 7), specifically in the riparian and wetland habitats (VU3).

Table 9: Plant species identified during the site survey

Species	Common name	VU	Conservation	Red List Status
Amaranthus hybridus	Pigweed	1, 2	Exotic	-
Amaranthus spinosus	Thorny pigweed	1	Exotic	-
Argyrolobium speciosum		1		LC
Aristida aequiglumis		1		LC
Aristida congesta	Tassel three-awn	1		LC
Aristida junciformis	Ngoni three-awn	1		LC
Bidens pilosa	Common blackjack	1, 2	Exotic	-
Calamagrostis epigejos	Reedgrass	3		LC

Species	Common name	VU	Conservation	Red List Status
Chamaecrista mimosoides	Fishbone dwarf cassia	1		LC
Cirsium vulgare	Spear thistle	3	NEMBA: AIP Category 1b	-
Cleome monophylla	Spindlepod	1		LC
Conyza sumatrensis	Tall fleabane	2	Exotic	-
Cynodon dactylon	Couch grass	1, 2, 3		LC
Cyperus articulatus	Jointed flatsedge	3		LC
Cyperus denudatus	Winged sedge	1		LC
Cyperus fastigiatus		3		LC
Datura ferox	Large thorn apple	1	NEMBA: AIP Category 1b	-
Datura stramonium	Common thorn apple	2, 3	NEMBA: AIP Category 1b	-
Eragrostis chloromelas	Curly leaf	1, 3		-
Eragrostis curvula	Weeping love grass	1, 2, 3		LC
Eragrostis cylindriflora	Blousaadgras	1, 3		LC
Eragrostis gummiflua	Gum grass	1		LC
Eragrostis lehmanniana	Lehmann's love grass	1, 2		LC
Eragrostis patentipilosa	Footpath love grass	1		LC
Eragrostis plana	Tough love grass	1		LC
Eragrostis racemosa	Narrow heart love grass	1		LC
Eragrostis rigidior	Curly leaf	1		LC
Eragrostis trichophora	Hairy love grass	1		LC
Eriosema salignum	Umtamvuna eriosema	1		LC
Gomphocarpus rivularis		1		LC
Gomphostigma virgatum	River star	3		LC
Haplocarpha scaposa	False gerbera	1		LC
Helichrysum mundtii	Strooiblom	1, 3		LC
Helichrysum nudifolium	Hottentot's tea	1	Medicinal	LC
Hilliardiella oligocephala	Bicoloured-leaved vernonia	1		LC
Hyparrhenia hirta	Common thatching grass	3	Medicinal	LC
Hyparrhenia spp.		1		-
Hyperthelia dissoluta	Yellow thatching grass	1		LC
Imperata cylindrica	Cottonwool grass	1, 3		LC
Juncus articulatus		3a		-
Juncus effusus	Soft rush	3	Exotic	LC
Justicia anagalloides		1		-
Panicum natalense	Natal buffalo grass	1		LC
Paspalum urvillei	Tall paspalum	3		NE
Pennisetum clandestinum	Kikuyu grass	1	Exotic	NE
Persicaria lapathifolia	Spotted knotweed	3	Exotic	-
Phragmites australis	Common reed	3		LC
Pogonarthria squarrosa	Herringbone grass	1		LC
Polygala hottentotta	Small purple broom	1		LC
Pycreus polystachyos		3		LC
Salix babylonica	Weeping willow	3	Exotic	-
Scirpoides burkei	Biesie	1		LC
Senecio sp.		1		-
Setaria sphacelata	Golden bristle grass	1		-
Solanum sisymbriifolium	Dense-thorned bitter apple	1	NEMBA: AIP Category 1b	-
Sporobolus africanus	Rat's tail dropseed	1, 3		LC
Stoebe plumosa	Slangbos	1		LC
Tagetes minuta	Tall khaki weed	1, 2	Exotic	-
Themeda triandra	Red grass	1		LC
Typha capensis	Bulrush	3	Medicinal	LC

Species	Common name	VU	Conservation	Red List Status
Verbena bonariensis	Purple top	1, 2, 3	NEMBA: AIP Category 1b	-
Wahlenbergia undulata	African bluebell	1		LC

7.2 Faunal Assessment Results

7.2.1 Habitat integrity and Faunal species found

Species were recorded as sighted, and occurrence verified based on signs and dung. The areas surveyed focussed mainly on the areas where surface impacts would occur, specifically the opencast, TSF and river diversion footprints and the sensitive ecological features identified during the desktop and based on arial footage.

Large sections of the area proposed is currently subjected to agricultural practices.

Figure 10: General Site Characteristics – Impacted areas

The site proposed for OC6, OC6A and OC4B are all currently transformed habitat utilised as agricultural lands. Scattered wetlands have been noted. Natural habitat has been severely impacted within this footprint; however, a pristine natural area is found adjacent, across the fence. OC5 and OC4 footprints showed some mining disturbances which will be extended to include these proposed footprints completely and the river diversion will be implemented to continue mining across the banks of the Olifants river.

Figure 11: General Site Characteristics – Area where river diversion is proposed






Figure 12: General Site Characteristics – More natural terrain/habitat and patches of wetland

Large sections of the area under investigation consisted of grassland which land uses seemed to consist of wilderness, informal cattle grazing practices and mining impacts/terrain.

The faunal investigation provides a description of the ecological diversity in terms of species identification as well as the occurrence of threatened/sensitive species that is dependent on available habitat. During the desktop analysis, it was determined that several Red Data species were listed on the South African National Biodiversity database (SANBI) for the QDS that encompass the specific area.

The most important species of concern that will lead the management is determined to be:

- Species with specialised niches (riverine, ridges or any wetland areas);
- Species with large range requirements (grazing mammals and predatory species);
- Species that have limited adaptation capabilities (such as reptile niches);
- Migrating species (importance of the ecological and aquatic corridor).

Thirty-seven (37) species have been sighted and one (1) national SCC species confirmed within the footprints. Mammals protected or regulated under MNCA have been found to occur as well, and these species should not be interfered with, nor relocated. Generally, the area was found to be visibly impacted, with predominant mining and agricultural activities prevalent in the surrounding area. Remaining natural footprint areas were mostly still fenced off from the current mining activities and once the project implementation begins, it could impact on sensitive habitat such as the various wetlands found to scattered over the landscape.

Table 10: Species observed within and around the project area

Family	Species	Common Name	Sighting/Finding	Status and IUCN
Invertebrates				
Termitidae	*Termitaria species*	Mound building termites	Mounds	Least Concern
Pyrgomorphidae	*Dictophorus spumans*	Koppie Foam Grasshopper	Sightings	Least Concern

Family	Species	Common Name	Sighting/Finding	Status and IUCN
Pyrgomorphidae	*Zonocerus elegans*	Elegant Grasshopper	Sightings	Least Concern
Agelenidae	*Species unknown*	Funnel-web spiders	Sightings	Least Concern
Sparassidae	*Pseudomicrommata longipes*	Grass huntsman/ groot-dwaal krap spinnekop	Sightings	Least Concern
Danainae	*Amauris niavius*	Friar	Sightings	Least Concern
Pieridae	*Eurema brigitta*	Broad-Bordered Grass Yellow	Sighting	Least Concern
Butterflies				
Noctuidae	*Grammodes exclusiva*	Black and White Lines	Sighting – previously sighted	Least Concern
Nymphalidae	*Danaus chrysippus*	African Monarch	Sightings - General	Least Concern
Mammals				
Hystricidae	*Hystrix africaeaustralis*	Porcupine	Droppings and quills – Den found on the bank of pan	Least Concern
Herpestidae	*Atilax paludinosus*	Water Mongoose	Droppings	Least Concern MNCA Schedule 5
Herpestidae	*Cynictis penicillata*	Yellow Mongoose	Sighted	Least Concern MNCA Schedule 5
Canidae	*Canis mesomelas*	Jackal, Black-backed	Droppings	Least Concern MNCA Schedule 8 (Problem animals)
Pedetidae	*Pedetes capensis*	Spring hare	Droppings	Least Concern MNCA Schedule 5
Viverridae	*Genetta tigrina*	Large-spotted Genet	Droppings and signs	Least Concern MNCA Schedule 5
Bovidae	*Bos taurus*	Cattle	Sightings and Dung	Domestic
Mustelidae	*Anonyx or Hydrictis maculicollis sp.*	Otter	Scat found. Spraints found to occur at Olifants river itself along banks	*Aonyx capensis* Near Threatened (2016) *Hydrictis maculicollis* Vulnerable (2016), ToPs Protected
Avifauna				
Threskiornithidae	*Threskiornis aethiopicus*	Ibis, African Sacred	Sightings	Least Concern, ToPs Protected
Anatidae	*Alopochen aegyptiaca*	Egyptian goose	Sighted	Least Concern
Ardeidae	*Ardea cinerea*	Grey Heron	Sighted	Least Concern
Muscicapidae	*Oenanthe pileata*	Capped Wheatear	Sightings	Least Concern
Charadriidae	*Vanellus armatus*	Lapwing, Blacksmith	Sightings	Least Concern
Laridae	*Larus fuscus*	Lesser Black-backed Gull, presumably *L.f. fuscus*	Sightings	LC (Regional), LC (Global)
Locustellidae	*Bradypterus baboecala*	Little Rush Warbler	Sightings	Least Concern
Order: Strigiformes	*Species unknown since not sighted – presumed to be the Marsh owl*	Owl	Owl pellets, presumed to be Marsh owl	Least Concern
Ploceidae	*Plocepasser mahali*	White-browed sparrow-weaver	Sightings	Least Concern
Ploceidae	*Euplectes orix*	Southern Red Bishop	Sightings in Reed/Riverine Areas	Least Concern
Alaudidae	*Eremopterix leucotis*	Chestnut-backed sparrow-lark	Sightings	Least Concern
Ploceidae	*Euplectes ardens*	Red-Collared Widowbird	Sightings in Grasslands	Least Concern
Viduidae	*Vidua chalybeata*	Village Indigobird	Sightings in Grasslands	Least Concern

Family	Species	Common Name	Sighting/Finding	Status and IUCN
Hirundinidae	*Hirundo spilodera*	Cliff-swallow, South African	Sightings	Least Concern
Ploceidae	*Ploceus velatus*	Masked-weaver, Southern	Sightings	Least Concern
Ardeidae	*Bubulcus ibis*	Egret, Cattle	Sightings associated with Cattle	Least Concern
Pycnonotidae	*Pycnonotus barbatus*	Black-eyed Bulbul	Sightings	Least Concern
Numididae	*Numida meleagris*	Guineafowl, Helmeted	Sightings	Least Concern
Upupidae	*Upupa africana*	Hoopoe, African	Sightings	Least Concern
Turnicidae	*Turnix sylvaticus*	Buttonquail	Sightings	Least Concern
Amphibians				
None sighted during field assessment				
Reptilian species				
None sighted during field assessment				

The faunal investigation provides a description of the ecological diversity in terms of species identification as well as the occurrence of threatened/sensitive species that is dependent on available habitat.

SENSITIVITY DELINEATION AND MAPPING

8 SENSITIVITY MAPPING AND GEOSPATIAL ANALYSIS

The objective of a sensitivity mapping exercise is to determine the location and extent of all sensitive areas that must be protected from transforming land uses. The site has been found to have medium sensitivity in general based on current condition and impacts already present.

8.1 Motivation of factors incorporated in Sensitivity Delineation

The known Vegetation Groups, the Conservation plan and the field assessment were used as a general guideline to determine the conservation targets and current conservation of the area to be impacted by the activities (Please refer to Figure 4, Figure 5 and Figure 6 for a visual illustration).

The majority of the proposed project footprint (and extended 100 m project buffer) is located on land transformed for mining activities, with the remainder of the study site located on moderately to highly impacted grassland. The grassland habitat is heavily modified by large-scale edge effects from mining activities, crop farming and grazing, which has resulted in an altered grassland habitat.

No SCC were identified to occur on the project footprint during the site survey. However, two (2) flora SCC were considered to be moderately likely to occur on the project footprint, specifically in the riparian and wetland habitats (VU3).

The National Web Based Environmental Screening Tool indicated that the project footprint is of moderate and low sensitivity in terms of plant species, very high sensitivity in terms of terrestrial biodiversity and medium sensitivity in terms of animal species (refer to figures below).

8.2 Recommendation and Motivation of development footprints

A motivation must be provided if there were any development footprints identified that were identified as having "low" or "medium" terrestrial animal species sensitivity and were not considered appropriate.

All footprints considered for the development are considered to be a combination of High-Low sensitivity based on the field assessment findings. The areas chosen are considered appropriate for the development since largest sections of the footprints proposed are located on already disturbed footprints.

8.3 Project areas of influence (PAOI)

The following is prescribed to be included in the Sensitivity determinations:

a) *Where the nature of the activity is not expected to have an impact on species of conservation concern (SCC) beyond the boundary of the preferred site, the study area means the proposed development footprint within the preferred site.*
b) *Where the nature of the activity is expected to have an impact on SCC beyond the boundary of the preferred site, the project areas of influence (PAOI) must be determined by the specialist in accordance with Species Environmental Assessment Guideline, and the study area must include the PAOI, as determined.*

The site verification in terms of plant, animal and terrestrial biodiversity themes found that the majority of the project footprint is of low sensitivity (VU1 and VU2), with riparian zones rated as high sensitivity (VU3).

The figure below illustrates the sensitivity of the project footprint, based on the findings of the desktop assessment and site survey.

It is important to note that sensitivity buffers as calculated and determined in the Wetland Assessment have not been considered for the Terrestrial Ecology Sensitivity. It is none-the-less important the buffer areas indicated in the Wetland Assessment are taken into account in the project planning and implementation.

However, no substantial impacts to SCC are expected beyond the boundary of the preferred sites.

8.4 Protected Areas, NPAES, IBAs and Other

No protected areas, in terms of NEMPAA, are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km.

No NPAES areas are situated within 10 km of the project footprint. The project footprint is not located in a SWSA or a FEPA.

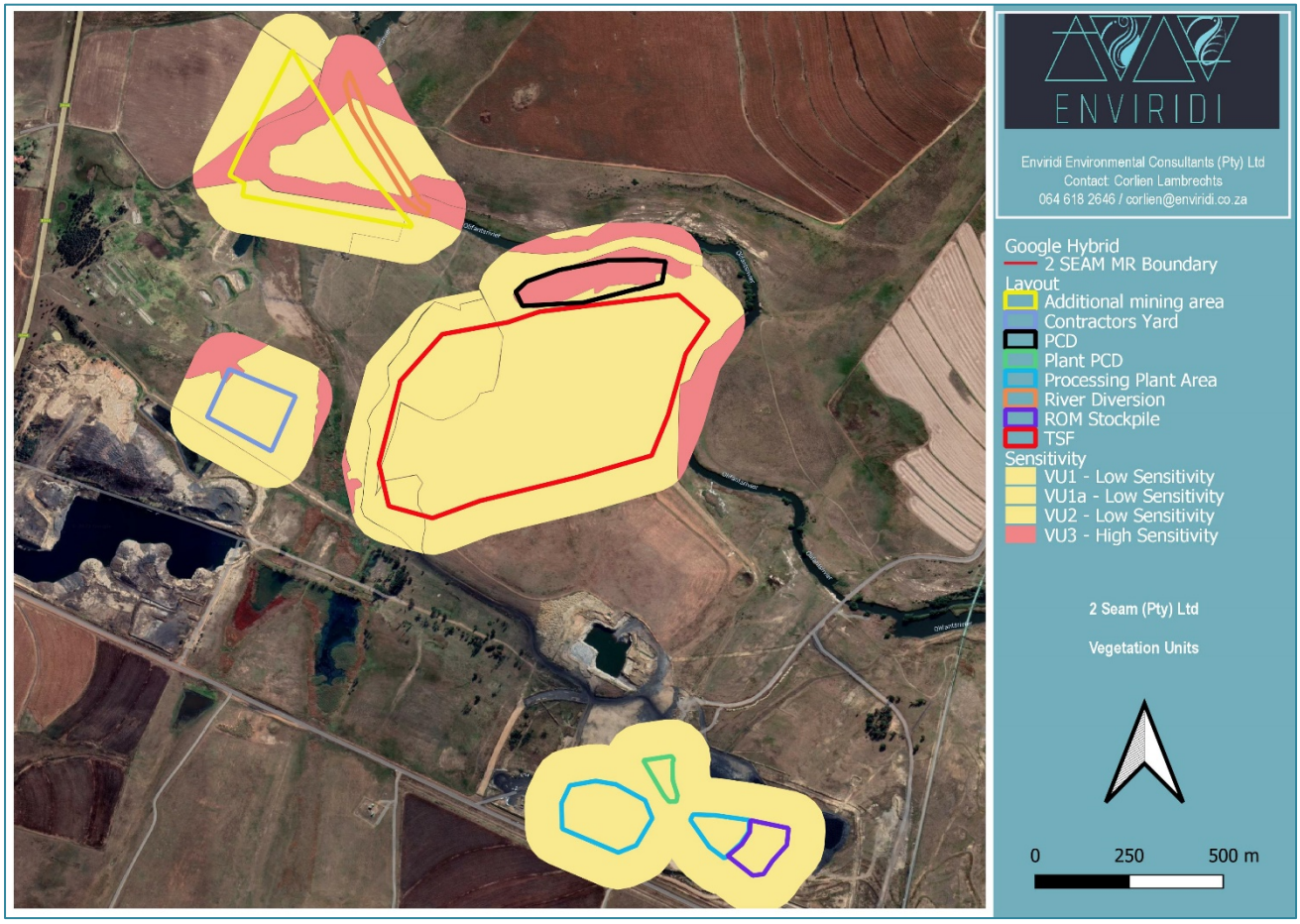

Figure 13: Sensitivity delineated according to habitat remaining condition thereof (including other ecological considerations)

Opposed to the field supported sensitivity delineated above, the following is provided in accordance with the National Screening Tool, which needs to be considered as per minimum requirements for Ecological and Terrestrial Biodiversity Assessments.

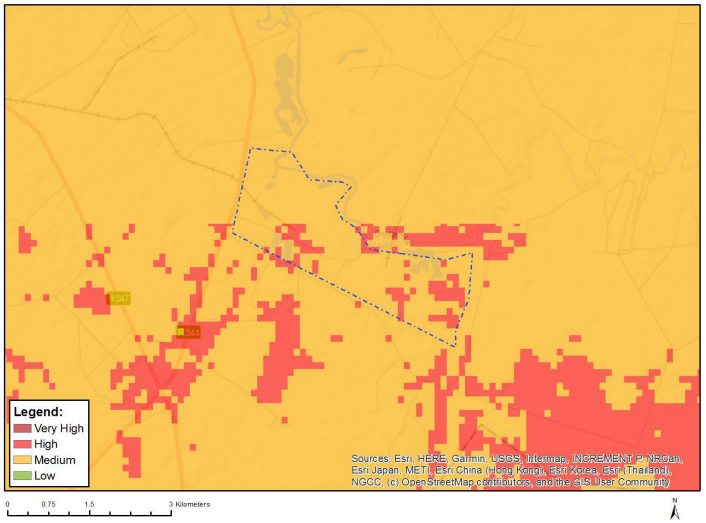

Figure 14: Animal Species Sensitivity – National Screening Tool – Categorised as High Sensitivity

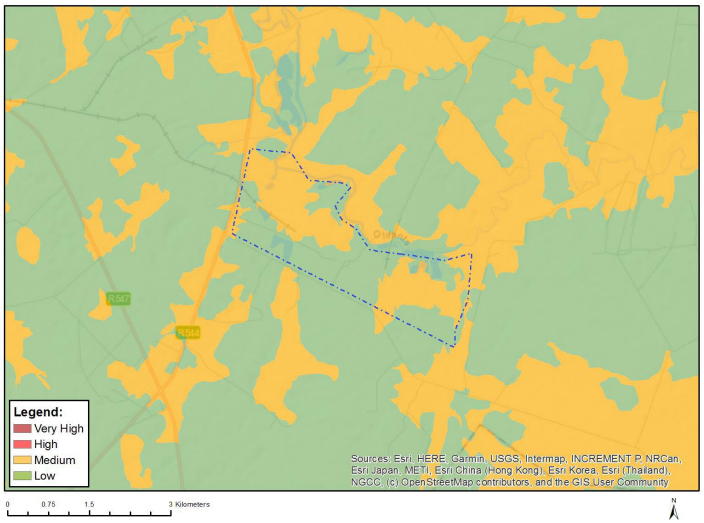

Figure 15: Plant Species Sensitivity – National Screening Tool – Categorised as Medium Sensitivity

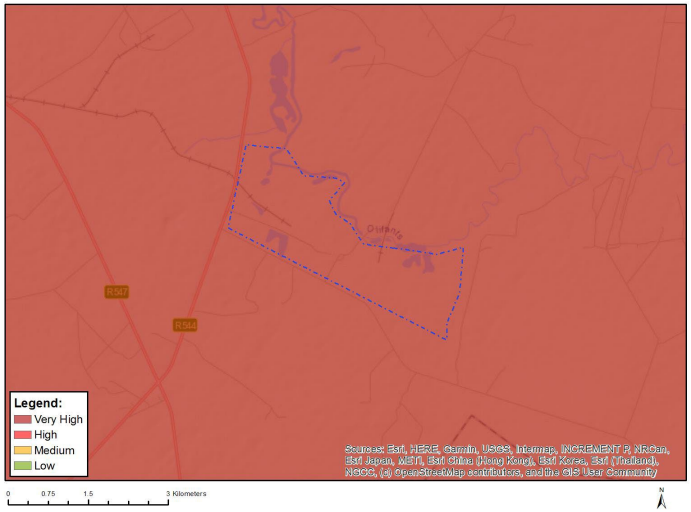

Figure 16: Terrestrial Biodiversity Sensitivity – National Screening Tool – Categorised as Very High Sensitivity

IMPACT ASSESSMENT

9 ENVIRONMENTAL IMPACT ASSESSMENT

All forms of development will have an immediate effect on the natural environment. It is therefore of utmost importance to provide information on the environmental consequences these activities will have and to inform the decision-makers thereof.

The preferred format has been incorporated into the document and an explanation of the impact assessment criteria is defined below (Table 11).

9.1 Assessment Criteria

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines, National Environmental Management Act (Act No. 107 of 1998): EIA Regulations (2014) and as amended from time to time.

The level of detail as depicted in the EIA Guidelines was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes, each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.

Table 11: Impact Assessment Criteria

EXTENT	
Classification of the physical and spatial scale of the impact	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
DURATION	
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
Short to Medium term	The impact will be relevant through to the end of a construction phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
PROBABILITY	

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.
Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.
- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including construction, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

9.2 Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

- ***Determination of Significance-Without Mitigation***

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". Significance is rated on the following scale:

Table 12: Significance-Without Mitigation

NO SIGNIFICANCE	The impact is not substantial and does not require any mitigation action.
LOW	The impact is of little importance, but may require limited mitigation.
MEDIUM	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
HIGH	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

- ***Determination of Significance- With Mitigation***

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

Table 13: Significance- With Mitigation

NO SIGNIFICANCE	The impact will be mitigated to the point where it is regarded as insubstantial.
LOW	The impact will be mitigated to the point where it is of limited importance.
LOW TO MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
MEDIUM TO HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

9.3 Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

- ***Ranking, Weighting and Scaling***

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 19). The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 14: Description of assessment parameters with its respective weighting

EXTENT		DURATION		INTENSITY		PROBABILITY		WEIGHTING FACTOR (WF)		SIGNIFICANCE RATING (SR)	
Footprint	1	Short term	1	Low	1	Improbable	1	Low	1	Low	0-19
Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100

MITIGATION EFFICIENCY (ME)		SIGNIFICANCE FOLLOWING MITIGATION (SFM)	
High	0.2	Low	0 - 19
Medium to High	0.4	Low to Medium	20 - 39
Medium	0.6	Medium	40 - 59
Low to Medium	0.8	Medium to High	60 - 79
Low	1.0	High	80 - 100

- ***Identifying the Potential Impacts Without Mitigation Measures (WOM)***

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

- ***Identifying the Potential Impacts with Mitigation Measures (WM)***

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

- ***Mitigation Efficiency (ME)***

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency

or WM = WOM x ME

- ***Significance Following Mitigation (SFM)***

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

9.4 IMPACT ASSESSMENT AND MITIGATION MEASURES

9.4.1 Risk Assessment

9.4.1.1 Construction Phase and Operational Phase

Construction Impacts on the Natural Terrestrial environment

Impact The site has sections which have been modified, and habitat has been transformed to an extent based on mining activities in the area, however, the onset of additional activities might result in impacts to the natural environment due to increased movement, traffic and large machinery to the area. Development related activities will specifically lead to damage or degradation of highly sensitive habitats (VU3) and overall loss of biodiversity and ecosystem function within the clearance area. As a result of the construction of these additional activities further fragmentation, degradation or compression may occur.
Mitigation • Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary. • Adhere to all management and mitigation measures as prescribed within other specialist reports and Environmental Management Programme (EMPr). • To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees. • Prevent impacts from reaching downstream water resources by ensuring installation and proper functioning of stormwater systems and drains to prevent contaminated water entering the natural environment.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Regional (3)	Regional (3)
Duration	Permanent (5)	Permanent (5)

Magnitude	Medium high (4)	Medium high (4)
Probability	Definite (5)	Definite (5)
Weighting factor	Medium high (4)	Medium high (4) X 0.8 ME
Significance Rating (SR)	Medium to high (68)	Medium (54.4)

Construction and Operational Impacts on the Natural Terrestrial Environment

Impact

Endemic, protected and/or SCC species could possibly occur within the area of construction and could be destroyed without proper knowledge and/or mitigation measures. Development related activities may lead to the loss of floral species of conservation concern. Although no SCC were found to occur on the project footprint, two SCC species are considered to be moderately likely to occur on the project footprint.

Development and related activities could impact on the sensitive habitats (VU3) situated in and around the development footprint, including impacts from effluent discharge into the environment from the coal stockpiles, coal spillages and other contaminated areas.

Mitigation

- All footprint areas should remain as small as possible. This can be achieved by fencing footprint areas to contain all activities within designated areas.
- If any SCC are encountered within the subject property in the future, the following should be ensured:
    - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas or within designated open space on the subject property.
    - All rescue and relocation plans should be overseen by a suitably qualified specialist.
    - Obtain relevant permits/consent, if applicable, for each protected or endangered floral species identified within the proposed development area that will be destroyed.
    - Human and vehicle movement should be restricted from taking place in sensitive habitats. Areas to be fenced if necessary.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Regional (3)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (5)	High (5)
Probability	Definite (5)	Definite (5)
Weighting factor	Medium-High (4)	Medium-High (4) x 0.8 ME
Significance Rating (SR)	Medium to high (72)	Medium (57.6)

Construction Impacts on the Natural Terrestrial environment

Impact

Fragmentation of habitat areas due to possible fencing or the placement of boundary structures could lead to increased edge effects. Habitat that is not to be cleared, needs to be protected.

Mitigation

- Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary.
- Adhere to all management and mitigation measures as prescribed within other specialist reports and Environmental Management Programme (EMPr).
- Keep the footprints as small as possible and clear only the designated approved areas.
- During the construction phase control of access should be implemented for all remaining natural areas to prevent unnecessary destruction of habitats or disturbance of species. It is also important that no additional fragmentation occurs and that all roads are clearly demarcated and kept to. No vehicles or personnel should be permitted outside of these demarcated roads.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Regional (3)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Medium (3)	Medium (3)

Probability	Definite (5)	Definite (5)
Weighting factor	Medium (3)	Medium (3) X 0.6 ME
Significance Rating (SR)	Medium (48)	Low to Medium (28.8)

Construction and Operational Impacts on the Natural Terrestrial Environment

Impact Impacts may lead to the further increase of invasive species from the surrounding areas and may change the vegetation structure and composition of this unit. It may also result in the spread of the invaders already found on-site to other surrounding areas. Proliferation of AIP species in riparian areas are especially problematic due to the relative ease of AIP transport to downstream areas.
Mitigation • Implement an Alien and Invasive Management Programme, which will aim to remove and manage the plants recorded during the field survey, since most of these species are already listed on the Alien and Invasive Species list as published in 2020. • Ensure awareness amongst all staff, contractors and visitors to site to not needlessly damage flora. • To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Site (2)	Site (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Medium (3)	Medium (3)
Probability	Definite (5)	Definite (5)
Weighting factor	Medium (3)	Medium (3) X 0.6 ME
Significance Rating (SR)	Medium (45)	Low to Medium (27)

Construction Impacts on the Natural Terrestrial (and potentially Aquatic) environment

Impact Anthropogenic influence stemming from employees, visitors and contractors that infiltrate the natural veld areas will damage and impact on species communities within certain areas. Effluent discharge into the environment from the coal stockpiles, coal spillages and other contaminated areas may negatively affect terrestrial ecosystems, especially sensitive habitats associated with riparian and wetland areas (VU3).
Mitigation • Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary. • Prevent impacts from reaching downstream water resources by ensuring installation and proper functioning of stormwater management systems.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Regional (3)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Medium (3)	Medium (3)
Probability	Likely (3)	Definite (5)
Weighting factor	Medium (4)	Medium (3) X 0.6 ME
Significance Rating (SR)	Medium (56)	Low to Medium (33.6)

9.4.1.2 Closure/Post-Closure Phase for activities

Closure Impacts on the Natural Terrestrial (and potentially Aquatic) environment

Impact

Rehabilitation could be ineffective if measures are not appropriately complied to. Without the necessary mitigation measures, rehabilitation will be unsuccessful, and the environment will not be self-sustaining. Without mitigation the alien invasive species will increase and result in a degraded veld condition making the property less viable for post-closure land use activities such as wilderness, grazing and agriculture.
Mitigation • A management plan for control of invasive/exotic plant species needs to be implemented for all footprint and surrounding areas. This will be ongoing until the end of the mining closure phase. • Rehabilitation plans should be planned long before the closure phase is due. Continuous rehabilitation should also take place during the operational phase. • Rehabilitation plan should be implemented. This includes the process of replanting the vegetation. Rehabilitation plans should be compiled with the use of a specialist and the correct seeding techniques and mixtures should be applied. • Close monitoring of plant communities to ensure that ecology is restored and self-sustaining. The monitoring of the flora should be conducted annually by the environmental practitioner, until a suitably qualified specialist deems the monitoring to no longer be necessary. A report should be written and stored and should be available at all times.

Potential impact predicted during construction/operation		
Aspect	No Mitigation	With Mitigation
Extent	Regional (3)	Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Medium (3)
Probability	Likely (3)	Likely (3)
Weighting factor	Medium to high (4)	Medium to high (4) x 0.6 ME
Significance Rating (SR)	Medium (52)	Low to medium (31.2)

9.4.1.3 Cumulative impacts

Incremental losses and fragmentation of habitat are two of the more serious cumulative impacts in terms of fauna and flora. Given the nature of the surrounding landscape, the characteristics and sensitivity of the affected area, the nature of the proposed development, and the potential for cumulative impacts are expected to be low. This is mainly due to the fact that the general area is already impacted and utilised as mining and large-scale mining developments occur within the vicinity.

It was not realistically possible to perform a scoring impact assessment for the cumulative impacts based on the available information. The most important aspect related to cumulative impact management for the development, will be to prevent contamination of the surrounding environment, especially in this case the river diversion proposed and possible contamination reaching the water environment with possible waste products stemming from Residue stockpiles and impacts are not easily reversed and remediated if it reaches surface- or groundwater environments.

MITIGATION, MANAGEMENT AND CONCLUSIONS

10 TERRESTRIAL MANAGEMENT PLAN AND RECOMMENDATIONS

10.1 Pre-Construction Phase

- The vegetation removal during the construction phase should be controlled, very specific and the clearance area kept as small as possible.
- A Wetland Assessment, including sensitive buffer calculation, should be undertaken for the project.
- The diversion of the Olifants River should be designed by an engineer and must be accompanied by a comprehensive rehabilitation implementation plan compiled by a suitably qualified and experienced specialist.
- Continuous rehabilitation of the area should occur during construction, where re-vegetation practices should be prioritised.
- A spot-check for SCC species on the project footprint area should be undertaken by a suitably qualified specialist or ECO prior to the start of construction, specifically where natural habitat will be cleared.
- If any SCC are encountered within the subject property in the future, the following should be ensured:
    - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas or within designated open space on the subject property.
    - All rescue and relocation plans should be overseen by a suitably qualified specialist.
    - Obtain relevant permits/consent, if applicable, for each protected or endangered floral species identified within the proposed development area that will be destroyed.
    - Human and vehicle movement should be restricted from taking place in sensitive habitats. Areas to be fenced if necessary.

10.2 Construction and Operational Phases

Aims and Objectives

- Prevent the needless loss of or damage to flora particularly with regard to protected, endemic, near-endemic and rare species to keep the specific habitat type as unaltered as possible. This will include the active management of Alien and Invasive species around the perimeter and within the development footprint.
- Prevent death, injury or hindrance to any fauna encountered during the project phases, and particularly with regard to any possible protected or endemic species.
- Prevent impacts from reaching the downstream river environments at any stage of the development as these will impact the aquatic life within the systems as well as impact all the animals using the water resources on-site as well as downstream impacts.
- Prevent impacts from reaching downstream water resources by ensuring installation and proper functioning of stormwater systems and drains to prevent contaminated water entering the natural environment.

Ecological Mitigation and Management measures

- Keep spill kits and hazmat prevention kits on-site to remediate any spill immediately before reaching the natural environment during the construction and operational phase.
- Adhere to all management and mitigation measures as prescribed within the other specialist reports and Environmental Management Programme.
- Ensure awareness amongst all staff, contractors and visitors to site to not needlessly harm or hinder animals or damage flora that is endemic and serve as habitat for the animals inhabiting the area.
- Allow animals to escape areas of activity freely and do not hinder their movement.
- All activities should be preferably restricted to one area as delineated within the formal layout. Strict measurements should be implemented.

Monitoring

Monitoring framework should be initiated, and the following system may enforce and encourage good practice:

- Alien invasive awareness, eradication and control programme by a specialist or as part of the current Alien and Invasive Strategy implemented at 2 Seam.

11 CONCLUSIONS

2 Seam is planning to add additional opencast mining areas (i.e., OC04A and OC04B) within the existing mining right areas to extend the Life-of-Mine (LoM). Furthermore 2 Seam will be applying for a coal washing plant and tailings facility on site, associated stormwater management infrastructure (PCDs and clean and dirty water berms), a contractor's yard and a river diversion.

According to the National Vegetation Map (SANBI 2006 – 2018) the project area is located in the Grassland biome. One vegetation type occurs in the project area, namely Eastern Highveld Grassland (Gm12).

Eastern Highveld Grassland is shown as Vulnerable and in the "National List of Ecosystems that are Threatened and need of protection", which is also reflected by the 2018 National Biodiversity Assessment.

The study area contains the following biodiversity classes from the MBSP:

- Modified ('Transformed'): The majority of the project footprint is located on areas categorised as Modified. The Modified areas are located in areas which have been transformed by current and historic mining activities as possible crop cultivation prior to mining. Based on the findings of the site survey, the specialist determined that these areas should be considered as Modified.
- Other Natural Areas (ONA): Sections of the proposed project footprint are located in areas categorised as ONA. Based on the findings of the site survey some of the areas categorised as ONA, would be more accurately designated as Modified, due to existing mining activities and crop cultivation.

No protected areas, in terms of NEMPAA, are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km of the proposed road route.

SITE SURVEY RESULTS

Habitat integrity and Floral species found
The project footprint is approximately 64 ha in extent.

No SCC were identified to occur on the project footprint during the site survey. However, six flora SCC were identified for the project area during the desktop assessment, of which two were considered to be moderately likely to occur on the project footprint, specifically in the riparian and wetland habitats (VU3).

Habitat integrity and Faunal species found

Thirty-seven (37) species have been sighted and one (1) national SCC species confirmed within the footprints. Mammals protected or regulated under MNCA have been found to occur as well, and these species should not be interfered with, nor relocated. Generally, the area was found to be visibly impacted, with predominant mining and agricultural activities prevalent in the surrounding area. Remaining natural footprint areas were mostly still fenced off from the current mining activities and once the project implementation begins, it could impact on sensitive habitat such as the various wetlands found to scattered over the landscape.

SENSITIVITY MAPPING AND GEOSPATIAL ANALYSIS

The site verification in terms of plant, animal and terrestrial biodiversity themes found that the majority of the project footprint is of low sensitivity (VU1 and VU2), with riparian zones rated as high sensitivity (VU3).

No protected areas, in terms of NEMPAA, are located within 10 km of the project area. No conservation areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas), as per the South African Conservation Area Database (SACAD), are located within 10 km.

No NPAES areas are situated within 10 km of the project footprint. The project footprint is not located in a SWSA or a FEPA.

It's the reasoned opinion of the specialist that the development may continue if all mitigation measures are implemented.

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South African Legislation ToPS List: https://www.environment.gov.za
IUCN: http://iucnredlist.org
Threatened Species Programme: SANBI Red list of South African Plants: http://redlist.sanbi.org
European Commission: www.eusoils.jrc.ec.europa.eu
Web: Biodiversityexplorer.org
SANBI Database: www.sanbi.org
SANBI GIS: www.bgis.sanbi.org
South African Birds Atlas Project 2: sabap2.adu.org.za
Plants of South Africa (POSA): http://newposa.sanbi.org/sanbi/Explore

13 APPENDICES

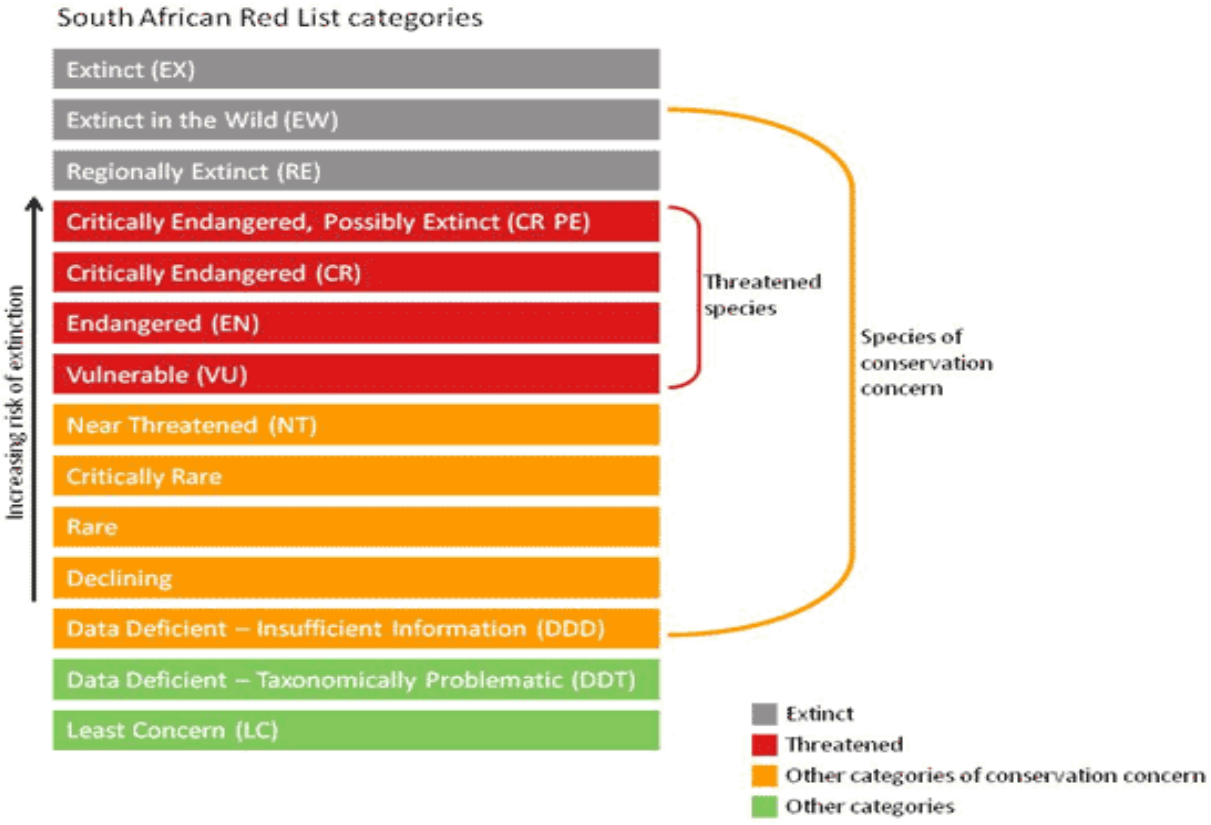
Appendix A: IUCN RED LIST DEFINITIONS
Appendix B: POSA FLORA SPECIES LIST FOR QDS
Appendix C: FAUNA SPECIES LIST FOR QDS
Appendix D: SPECIALIST CURRICULUM VITAE

APPENDIX A: IUCN RED LIST DEFINITIONS

Categories marked with "[N]" are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

Categories	Definition
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.
[N]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.
[N]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 five IUCN criteria. The four criteria are as follows: • Restricted range: Extent of Occurrence <500 km^2, OR • Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy, 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.
[N]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 (LC)	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.



APPENDIX B: FLORAL SPECIES - POSA

Species of Conservation Concern (SCC) are highlighted green
Exotic species are highlighted orange

Family	Species	Red List Status	Diagnostic	Conservation
Lamiaceae	*Aeollanthus buchnerianus*	LC	succulent; herb; dwarf shrub;	
Apiaceae	*Afrosciadium magalismontanum*	LC	herb;	
Poaceae	*Agrostis eriantha*	LC	graminoid;	
Hyacinthaceae	*Albuca virens*	LC	geophyte;	
Amaranthaceae	*Amaranthus hybridus*	-	herb;	Exotic
Poaceae	*Andropogon schirensis*	LC	graminoid;	
Bryaceae	*Anomobryum julaceum*	-	bryophyte;	
Fabaceae	*Argyrolobium longifolium*	VU	dwarf shrub;	Red List: VU, Endemic, Medicinal
Fabaceae	*Argyrolobium speciosum*	LC	herb;	
Apocynaceae	*Asclepias albens*	LC	herb;	
Apocynaceae	*Asclepias eminens*	LC	herb;	
Apocynaceae	*Asclepias gibba*	LC	herb;	
Apocynaceae	*Aspidoglossum biflorum*	LC	succulent; herb;	
Iridaceae	*Babiana flabellifolia*	LC	geophyte; herb;	Endemic
Asteraceae	*Berkheya radula*	LC	herb;	
Asteraceae	*Berkheya setifera*	LC	herb;	
Asteraceae	*Berkheya speciosa*	LC	herb;	
Blechnaceae	*Blechnum australe*	LC	lithophyte; geophyte; herb;	
Acanthaceae	*Blepharis innocua*	LC	herb;	Endemic
Acanthaceae	*Blepharis stainbankiae*	LC	herb;	Endemic
Poaceae	*Brachiaria serrata*	LC	graminoid;	
Bryaceae	*Bryum argenteum*	-	bryophyte;	
Cyperaceae	*Bulbostylis densa*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Bulbostylis humilis*	LC	mesophyte; cyperoid; herb;	
Poaceae	*Calamagrostis epigejos*	LC	graminoid;	
Apocynaceae	*Ceropegia rehmannii*	-	succulent; geophyte;	MNCA: Protected
Fabaceae	*Chamaecrista capensis*	LC	herb;	
Pteridaceae	*Cheilanthes viridis*	LC	lithophyte; geophyte; herb;	

Family	Species	Red List Status	Diagnostic	Conservation
Bruchiaceae	*Cladophascum gymnomitrioides*	-	bryophyte;	
Cleomaceae	*Cleome monophylla*	LC	herb;	
Apocynaceae	*Cordylogyne globosa*	LC	succulent; geophyte;	
Asteraceae	*Cosmos bipinnatus*	-	herb;	Exotic
Asteraceae	*Cotula anthemoides*	LC	herb;	
Crassulaceae	*Crassula capitella*	LC	succulent; herb;	
Orobanchaceae	*Cycnium tubulosum*	LC	herb;	
Cyperaceae	*Cyperus congestus*	LC	cyperoid; helophyte; herb;	
Cyperaceae	*Cyperus denudatus*	LC		
Cyperaceae	*Cyperus difformis*	LC	helophyte; mesophyte; cyperoid; herb;	
Cyperaceae	*Cyperus esculentus*	LC	mesophyte; cyperoid; geophyte; herb;	
Cyperaceae	*Cyperus fastigiatus*	LC	helophyte; cyperoid; herb;	
Cyperaceae	*Cyperus margaritaceus*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Cyperus marginatus*	LC	helophyte; cyperoid; herb;	
Cyperaceae	*Cyperus obtusiflorus*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Cyperus rigidifolius*	LC	mesophyte; cyperoid; helophyte; herb;	
Cyperaceae	*Cyperus rupestris*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Cyperus sphaerospermus*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Cyperus squarrosus*	LC	mesophyte; cyperoid; herb;	
Caryophyllaceae	*Dianthus transvaalensis*	LC	herb;	
Asteraceae	*Didelta carnosa*	LC	succulent; dwarf shrub;	
Hyacinthaceae	*Dipcadi viride*	LC	geophyte;	
Orchidaceae	*Disa woodii*	LC	geophyte; herb;	MNCA: Protected
Cyperaceae	*Eleocharis dregeana*	LC	cyperoid; helophyte; herb;	
Poaceae	*Eragrostis lappula*	LC	graminoid;	
Fabaceae	*Eriosema salignum*	LC	herb;	
Fabaceae	*Eriosema simulans*	LC	herb;	
Ruscaceae	*Eriospermum porphyrium*	LC	geophyte;	
Ruscaceae	*Eriospermum porphyrovalve*	LC	geophyte;	
Exormothecaceae	*Exormotheca holstii*	-	bryophyte;	
Cyperaceae	*Fimbristylis complanata*	LC	cyperoid; helophyte; herb;	
Cyperaceae	*Fuirena pachyrrhiza*	LC	cyperoid; helophyte; herb;	
Asteraceae	*Geigeria burkei*	NE	herb;	Endemic

Family	Species	Red List Status	Diagnostic	Conservation
Iridaceae	*Gladiolus elliotii*	LC	geophyte; herb;	MNCA: Protected
Iridaceae	*Gladiolus papilio*	LC	geophyte; herb;	MNCA: Protected
Apocynaceae	*Gomphocarpus rivularis*	LC	shrub; herb;	
Amaranthaceae	*Guilleminea densa*	-	herb;	Exotic
Asteraceae	*Helichrysum nudifolium*	LC	herb;	Medicinal
Malvaceae	*Hibiscus trionum*	-	herb;	Exotic
Poaceae	*Hyparrhenia dregeana*	LC	graminoid;	
Fabaceae	*Indigofera frondosa*	LC	shrub;	
Convolvulaceae	*Ipomoea crassipes*	LC	succulent; herb;	
Convolvulaceae	*Ipomoea ommanneyi*	LC	succulent; herb;	
Cyperaceae	*Isolepis costata*	LC	helophyte; cyperoid; herb;	
Juncaceae	*Juncus oxycarpus*	LC	helophyte; herb;	
Aizoaceae	*Khadia carolinensis*	VU	succulent;	Red List: VU, Endemic
Cyperaceae	*Kyllinga alba*	LC	mesophyte; cyperoid; herb;	
Cyperaceae	*Kyllinga erecta*	LC	helophyte; cyperoid; herb;	
Hydrocharitaceae	*Lagarosiphon muscoides*	LC	hydrophyte; herb;	
Thymelaeaceae	*Lasiosiphon microcephalus*	-	shrub; dwarf shrub;	
Hyacinthaceae	*Ledebouria cooperi*	LC	geophyte;	
Poaceae	*Leptochloa fusca*	LC	graminoid;	
Cyperaceae	*Lipocarpha nana*	LC	cyperoid; helophyte; herb;	
Cyperaceae	*Lipocarpha rehmannii*	LC	cyperoid; helophyte; herb;	
Fabaceae	*Lotus discolor*	LC	herb;	
Poaceae	*Melinis nerviglumis*	LC	graminoid;	
Fabaceae	*Melolobium wilmsii*	LC	dwarf shrub;	Endemic
Convolvulaceae	*Merremia verecunda*	LC	herb;	
Iridaceae	*Moraea filicaulis*	LC		Endemic
Fabaceae	*Mucuna coriacea*	LC		
Amaryllidaceae	*Nerine angustifolia*	LC	geophyte;	
Amaryllidaceae	*Nerine rehmannii*	LC	geophyte;	
Hyacinthaceae	*Ornithogalum flexuosum*	LC	geophyte;	
Orchidaceae	*Orthochilus leontoglossus*	LC		MNCA: Protected
Polygonaceae	*Oxygonum dregeanum*	NE	herb;	
Poaceae	*Paspalum dilatatum*	NE	graminoid;	Exotic

Family	Species	Red List Status	Diagnostic	Conservation
Poaceae	*Paspalum urvillei*	NE	graminoid;	Exotic
Pteridaceae	*Pellaea calomelanos*	LC	lithophyte; geophyte; herb;	Medicinal
Polygonaceae	*Persicaria amphibia*	LC	helophyte; hydrophyte; herb;	Exotic
Polygalaceae	*Polygala hottentotta*	LC	dwarf shrub; herb;	
Polygalaceae	*Polygala krumanina*	LC	shrub;	Endemic
Portulacaceae	*Portulaca oleracea*	-	succulent; herb;	Exotic
Cyperaceae	*Pycreus macranthus*	LC	cyperoid; helophyte; herb;	
Cyperaceae	*Pycreus pumilus*	LC	cyperoid; helophyte; herb;	
Ricciaceae	*Riccia albovestita*	-	bryophyte;	
Ricciaceae	*Riccia atropurpurea*	-	bryophyte;	
Ricciaceae	*Riccia elongata*	-	bryophyte;	Endemic
Ricciaceae	*Riccia okahandjana*	-	bryophyte;	
Ricciaceae	*Riccia rosea*	-	bryophyte;	
Brassicaceae	*Rorippa fluviatilis*	LC	herb;	
Cyperaceae	*Schoenoplectus corymbosus*	LC	helophyte; cyperoid; emergent hydrophyte; herb;	
Cyperaceae	*Schoenoplectus muricinux*	LC	cyperoid; helophyte; emergent hydrophyte; herb;	
Cyperaceae	*Schoenoplectus tabernaemontani*	-	cyperoid; helophyte; emergent hydrophyte; herb;	Exotic
Cyperaceae	*Scirpoides burkei*	LC	mesophyte; cyperoid; herb;	
Anacardiaceae	*Searsia dentata*	LC	shrub; tree;	Medicinal
Anacardiaceae	*Searsia magalismontana*	LC	dwarf shrub;	
Scrophulariaceae	*Selago densiflora*	LC	herb;	
Asteraceae	*Senecio harveianus*	LC	herb; dwarf shrub;	
Malvaceae	*Sida chrysantha*	LC	dwarf shrub;	
Apocynaceae	*Sisyranthus randii*	LC	herb;	
Asteraceae	*Sonchus asper*	-	herb;	Exotic
Orobanchaceae	*Striga elegans*	LC	parasite; herb;	
Lamiaceae	*Syncolostemon pretoriae*	LC	herb;	
Santalaceae	*Thesium costatum*	LC	parasite; herb;	
Poaceae	*Triraphis andropogonoides*	LC	graminoid;	
Asteraceae	*Ursinia cakilefolia*	LC	herb;	Endemic
Fabaceae	*Vigna unguiculata*	NE	climber; herb;	

APPENDIX C:
FAUNA SPECIES LIST FOR 2629AB QDS

Table 15: Mammal species found in QDS 2629AB (MammalMAP)

Family	Scientific name	Common name	Red list category
	ORDER Rodentia	Unidentified Rodentia	
Felidae	*Felis nigripes*	Black-footed Cat	Vulnerable (2016)
Felidae	*Leptailurus serval*	Serval	Near Threatened (2016), MNCA Schedule 5
Muridae	*Gerbilliscus brantsii*	Highveld Gerbil	Least Concern (2016)
Muridae	*Mastomys coucha*	Southern African Mastomys	Least Concern (2016)
Muridae	*Mus (Nannomys) minutoides*	Southern African Pygmy Mouse	Least Concern
Muridae	*Otomys auratus*	Southern African Vlei Rat (Grassland type)	Near Threatened (2016)
Muridae	*Rhabdomys pumilio*	Xeric Four-striped Grass Rat	Least Concern (2016)
Mustelidae	*Hydrictis maculicollis*	Spotted-necked Otter	Vulnerable, MNCA Schedule 2
Nesomyidae	*Dendromus mystacalis*	Chestnut African Climbing Mouse	Least Concern (2016)
Soricidae	*FAMILY Soricidae*	Unidentified Soricidae (Shrew)	
Soricidae	*Crocidura mariquensis*	Swamp Musk Shrew	Near Threatened (2016)
Soricidae	*Myosorex varius*	Forest Shrew	Least Concern (2016)

Table 16: Avifaunal species found in pentad (SABAP2)

Common Name	Scientific Name	Regional	Global
Hamerkop	*Scopus umbretta*		
Neddicky	*Cisticola fulvicapilla*		
Quailfinch	*Ortygospiza atricollis*		
Secretarybird	*Sagittarius serpentarius*	VU	VU
Apalis, Bar-throated	*Apalis thoracica*		
Avocet, Pied	*Recurvirostra avosetta*		
Barbet, Black-collared	*Lybius torquatus*		
Barbet, Crested	*Trachyphonus vaillantii*		
Bee-eater, European	*Merops apiaster*		
Bishop, Southern Red	*Euplectes orix*		
Bishop, Yellow-crowned	*Euplectes afer*		
Bittern, Little	*Ixobrychus minutus*		
Bulbul, Dark-capped	*Pycnonotus tricolor*		

Buzzard, Common	*Buteo buteo*		
Canary, Black-throated	*Crithagra atrogularis*		
Canary, Cape	*Serinus canicollis*		
Canary, Yellow	*Crithagra flaviventris*		
Canary, Yellow-fronted	*Crithagra mozambica*		
Chat, Ant-eating	*Myrmecocichla formicivora*		
Chat, Familiar	*Oenanthe familiaris*		
Cisticola, Cloud	*Cisticola textrix*		
Cisticola, Levaillant's	*Cisticola tinniens*		
Cisticola, Pale-crowned	*Cisticola cinnamomeus*		
Cisticola, Wing-snapping	*Cisticola ayresii*		
Cisticola, Zitting	*Cisticola juncidis*		
Coot, Red-knobbed	*Fulica cristata*		
Cormorant, Reed	*Microcarbo africanus*		
Cormorant, White-breasted	*Phalacrocorax lucidus*		
Crake, Black	*Zapornia flavirostra*		
Crow, Pied	*Corvus albus*		
Cuckoo, Diederik	*Chrysococcyx caprius*		
Darter, African	*Anhinga rufa*		
Dove, Cape Turtle	*Streptopelia capicola*		
Dove, Laughing	*Spilopelia senegalensis*		
Dove, Namaqua	*Oena capensis*		
Dove, Red-eyed	*Streptopelia semitorquata*		
Dove, Rock	*Columba livia*		
Duck, African Black	*Anas sparsa*		
Duck, Maccoa	*Oxyura maccoa*	NT	VU
Duck, White-backed	*Thalassornis leuconotus*		
Duck, White-faced Whistling	*Dendrocygna viduata*		
Duck, Yellow-billed	*Anas undulata*		
Egret, Great	*Ardea alba*		
Egret, Intermediate	*Ardea intermedia*		
Egret, Little	*Egretta garzetta*		
Egret, Western Cattle	*Bubulcus ibis*		
Falcon, Amur	*Falco amurensis*		

Fiscal, Southern	*Lanius collaris*		
Flamingo, Greater	*Phoenicopterus roseus*	NT	LC
Flycatcher, Spotted	*Muscicapa striata*		
Francolin, Orange River	*Scleroptila gutturalis*		
Francolin, Red-winged	*Scleroptila levaillantii*		
Goose, Egyptian	*Alopochen aegyptiaca*		
Goose, Spur-winged	*Plectropterus gambensis*		
Grassbird, Cape	*Sphenoeacus afer*		
Grebe, Great Crested	*Podiceps cristatus*		
Grebe, Little	*Tachybaptus ruficollis*		
Greenshank, Common	*Tringa nebularia*		
Guineafowl, Helmeted	*Numida meleagris*		
Gull, Grey-headed	*Chroicocephalus cirrocephalus*		
Harrier, Montagu's	*Circus pygargus*		
Heron, Black	*Egretta ardesiaca*		
Heron, Black-crowned Night	*Nycticorax nycticorax*		
Heron, Black-headed	*Ardea melanocephala*		
Heron, Goliath	*Ardea goliath*		
Heron, Grey	*Ardea cinerea*		
Heron, Purple	*Ardea purpurea*		
Heron, Squacco	*Ardeola ralloides*		
Hoopoe, African	*Upupa africana*		
Ibis, African Sacred	*Threskiornis aethiopicus*		
Ibis, Glossy	*Plegadis falcinellus*		
Ibis, Hadada	*Bostrychia hagedash*		
Ibis, Southern Bald	*Geronticus calvus*	VU	VU
Jacana, African	*Actophilornis africanus*		
Kestrel, Greater	*Falco rupicoloides*		
Kestrel, Rock	*Falco rupicolus*		
Kingfisher, Giant	*Megaceryle maxima*		
Kingfisher, Malachite	*Corythornis cristatus*		
Kingfisher, Pied	*Ceryle rudis*		
Kite, Black-winged	*Elanus caeruleus*		
Korhaan, Blue	*Eupodotis caerulescens*	LC	NT

Lapwing, African Wattled	*Vanellus senegallus*		
Lapwing, Blacksmith	*Vanellus armatus*		
Lapwing, Crowned	*Vanellus coronatus*		
Lark, Eastern Clapper	*Mirafra fasciolata*		
Lark, Pink-billed	*Spizocorys conirostris*		
Lark, Red-capped	*Calandrella cinerea*		
Lark, Rufous-naped	*Mirafra africana*		
Lark, Sabota	*Calendulauda sabota*		
Lark, Spike-heeled	*Chersomanes albofasciata*		
Longclaw, Cape	*Macronyx capensis*		
Martin, Banded	*Riparia cincta*		
Martin, Brown-throated	*Riparia paludicola*		
Martin, Common House	*Delichon urbicum*		
Martin, Sand	*Riparia riparia*		
Moorhen, Common	*Gallinula chloropus*		
Mousebird, Speckled	*Colius striatus*		
Myna, Common	*Acridotheres tristis*		
Owl, African Grass	*Tyto capensis*	VU	LC
Owl, Marsh	*Asio capensis*		
Pigeon, Speckled	*Columba guinea*		
Pipit, African	*Anthus cinnamomeus*		
Pipit, Nicholson's	*Anthus nicholsoni*		
Pipit, Plain-backed	*Anthus leucophrys*		
Plover, Kittlitz's	*Charadrius pecuarius*		
Plover, Three-banded	*Charadrius tricollaris*		
Pochard, Southern	*Netta erythrophthalma*		
Pratincole, Black-winged	*Glareola nordmanni*	NT	NT
Prinia, Black-chested	*Prinia flavicans*		
Prinia, Tawny-flanked	*Prinia subflava*		
Quail, Common	*Coturnix coturnix*		
Quelea, Red-billed	*Quelea quelea*		
Rail, African	*Rallus caerulescens*		
Robin-Chat, Cape	*Cossypha caffra*		
Roller, European	*Coracias garrulus*	NT	LC

Sandpiper, Common	*Actitis hypoleucos*		
Sandpiper, Curlew	*Calidris ferruginea*	LC	NT
Sandpiper, Marsh	*Tringa stagnatilis*		
Sandpiper, Wood	*Tringa glareola*		
Shelduck, South African	*Tadorna cana*		
Shoveler, Cape	*Spatula smithii*		
Snipe, African	*Gallinago nigripennis*		
Sparrow, Cape	*Passer melanurus*		
Sparrow, House	*Passer domesticus*		
Spoonbill, African	*Platalea alba*		
Spurfowl, Swainson's	*Pternistis swainsonii*		
Starling, Cape	*Lamprotornis nitens*		
Starling, Pied	*Lamprotornis bicolor*		
Starling, Red-winged	*Onychognathus morio*		
Stilt, Black-winged	*Himantopus himantopus*		
Stint, Little	*Calidris minuta*		
Stonechat, African	*Saxicola torquatus*		
Sunbird, Amethyst	*Chalcomitra amethystina*		
Swallow, Barn	*Hirundo rustica*		
Swallow, Greater Striped	*Cecropis cucullata*		
Swallow, Lesser Striped	*Cecropis abyssinica*		
Swallow, South African Cliff	*Petrochelidon spilodera*		
Swallow, White-throated	*Hirundo albigularis*		
Swamphen, African	*Porphyrio madagascariensis*		
Swift, African Black	*Apus barbatus*		
Swift, African Palm	*Cypsiurus parvus*		
Swift, Horus	*Apus horus*		
Swift, Little	*Apus affinis*		
Swift, White-rumped	*Apus caffer*		
Teal, Blue-billed	*Spatula hottentota*		
Teal, Cape	*Anas capensis*		
Teal, Red-billed	*Anas erythrorhyncha*		
Tern, Whiskered	*Chlidonias hybrida*		
Thick-knee, Spotted	*Burhinus capensis*		

Thrush, Karoo	*Turdus smithi*		
Wagtail, Cape	*Motacilla capensis*		
Warbler, African Reed	*Acrocephalus baeticatus*		
Warbler, Great Reed	*Acrocephalus arundinaceus*		
Warbler, Lesser Swamp	*Acrocephalus gracilirostris*		
Warbler, Little Rush	*Bradypterus baboecala*		
Warbler, Sedge	*Acrocephalus schoenobaenus*		
Warbler, Willow	*Phylloscopus trochilus*		
Waxbill, Common	*Estrilda astrild*		
Waxbill, Orange-breasted	*Amandava subflava*		
Weaver, Cape	*Ploceus capensis*		
Weaver, Southern Masked	*Ploceus velatus*		
Wheatear, Capped	*Oenanthe pileata*		
Wheatear, Mountain	*Myrmecocichla monticola*		
White-eye, Cape	*Zosterops virens*		
Whydah, Pin-tailed	*Vidua macroura*		
Widowbird, Fan-tailed	*Euplectes axillaris*		
Widowbird, Long-tailed	*Euplectes progne*		
Widowbird, Red-collared	*Euplectes ardens*		
Widowbird, White-winged	*Euplectes albonotatus*		
Wood Hoopoe, Green	*Phoeniculus purpureus*		
Wryneck, Red-throated	*Jynx ruficollis*		

Table 17: Butterfly species occurring in QDS

Family	Scientific name	Common name	Red list category
HESPERIIDAE	*Afrogegenes sp.*		
HESPERIIDAE	*Metisella meninx*	Marsh sylph	Least Concern (SABCA 2013)
LYCAENIDAE	*Zizeeria knysna knysna*	African grass blue	Least Concern (SABCA 2013)
NYMPHALIDAE	*Junonia hierta cebrene*	Yellow pansy	Least Concern (SABCA 2013)
NYMPHALIDAE	*Telchinia rahira rahira*	Marsh telchinia	Least Concern (SABCA 2013)
NYMPHALIDAE	*Vanessa cardui*	Painted lady	Least Concern (SABCA 2013)
PIERIDAE	*Eurema brigitta brigitta*	Broad-bordered grass yellow	Least Concern (SABCA 2013)

Table 18: Reptile species possibly occurring in QDS

Family	Scientific name	Common name	Red list category
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake	Least Concern (SARCA 2014)
Elapidae	*Naja mossambica*	Mozambique Spitting Cobra	Least Concern (SARCA 2014)
Gekkonidae	*Lygodactylus ocellatus*	Spotted Dwarf Gecko	Least Concern (SARCA 2014)
Gekkonidae	*Pachydactylus affinis*	Transvaal Gecko	Least Concern (SARCA 2014)
Gekkonidae	*Pachydactylus capensis*	Cape Gecko	Least Concern (SARCA 2014)
Lamprophiidae	*Boaedon capensis*	Brown House Snake	Least Concern (SARCA 2014)
Lamprophiidae	*Lycodonomorphus inornatus*	Olive House Snake	Least Concern (SARCA 2014)
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake	Least Concern (SARCA 2014)
Lamprophiidae	*Lycophidion capense capense*	Cape Wolf Snake	Least Concern (SARCA 2014)
Lamprophiidae	*Psammophylax rhombeatus*	Spotted Grass Snake	Least Concern (SARCA 2014)
Leptotyphlopidae	*Leptotyphlops sp.*		
Leptotyphlopidae	*Leptotyphlops scutifrons conjunctus*	Eastern Thread Snake	
Scincidae	*Trachylepis capensis*	Cape Skink	Least Concern (SARCA 2014)
Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink	Least Concern (SARCA 2014)
Typhlopidae	*Afrotyphlops bibronii*	Bibron's Blind Snake	Least Concern (SARCA 2014)
Viperidae	*Causus rhombeatus*	Rhombic Night Adder	Least Concern (SARCA 2014)

Table 19: Amphibian species found in 2629AB (FrogMAP)

Family	Scientific name	Common name	Red list category
Bufonidae	*Schismaderma carens*	Red Toad	Least Concern
Bufonidae	*Sclerophrys gutturalis*	Guttural Toad	Least Concern (IUCN, 2016)
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina	Least Concern
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	Least Concern
Phrynobatrachidae	*Phrynobatrachus natalensis*	Snoring Puddle Frog	Least Concern (IUCN, 2013)
Pipidae	*Xenopus laevis*	Common Platanna	Least Concern
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog	Least Concern (2017)
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco	Least Concern (2013)
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog	Least Concern

Table 20: Other Invertebrate species found in 2629AB

Family	Scientific name	Common name	Red list category
Odonata Species			
Coenagrionidae	*Africallagma glaucum*	Swamp Bluet	LC

Family	Scientific name	Common name	Red list category
Coenagrionidae	*Pseudagrion citricola*	Yellow-faced Sprite	LC
Libellulidae	*Pantala flavescens*	Wandering Glider	LC

APPENDIX D:
SPECIALIST CIRRICULUM VITAE

WORK REPORT: CORLIEN LAMBRECHTS

Personal Details

First name:	Corlien
Surname:	Lambrechts
Identity number:	8412040017088
Residential address:	51 Sunset Hills La Montagne
Telephone number:	064 618 2646
Health:	Excellent
Language:	Write, read and speak both Afrikaans and English

Professional Affiliations:

South African Council of Natural Scientific Professions - Pr.Sci.Nat (Reference number: 009135 for Environmental Sciences). Also a Cand.Sci.Nat. (South African Council Natural and Scientific Professionals) Candidate Natural Scientist (Ecology), Registration number: 100003/17.

Southern African Society of Aquatic Scientists (SASAQS Registration number: SASAQS0025)

South African Bat Assessment Association Registration number: 0054

Bird Life South Africa (BLSA) Member: SABAP Citizen scientist number: 20686; BLSA Membership number: 1041760

Accredited SASS5 (Aquatic Ecology Biomonitoring) Accreditations completed 2018, 2021.

Environmental Assessment Practitioners Association of South Africa (EAPASA Registration number: 2020/935).

Short Resumé

Corlien Lambrechts completed her (BSc) Environmental Management & Zoology through UNISA and completed practical Zoology courses at the North West University Potchefstroom Campus. She completed her final year Biodiversity Study at Vredefort Dome and an Entomology Project at the Roodeplaat Dam on Avifauna species, *Anhinga rufa* (African Darter). After working as a student at Geo Pollutions Technologies (Pty) Ltd and TUKS University Onderstepoort Campus, she started her career in Environmental Consulting at M2 Environmental Connections (MENCO) in 2013. She moved to the sister company (which is managed under the same Directors) of M2 Environmental Connections cc, namely Prescali Environmental Consultants (Pty) Ltd.

In 2015 she enrolled for her Honors degree in Zoology at the University of Pretoria where she completed a project in the Cathedral Peak Drakensberg Mountain range studying differences in community structures of invertebrate species between natural grasslands and grasslands subjected to rehabilitation by South African Environmental Observation Network (SAEON) and in association with the University of Pretoria Centre of Invasion Biology (CIB).

Since 2018, she has joined the team of Elemental-S on a permanent basis as a specialist and is also the owner of Enviridi Environmental Consultants (Pty) Ltd. where she specializes in the field of Ecology, Aquatic Ecology Biomonitoring. She has since gained competency and accreditation through the Department of Water and Sanitation (DWS) for aquatic monitoring (SASS5 Accredited) in 2018 and competency re-evaluation in 2021 (every three years). In 2021, she enrolled and completed the Rhodes University: Tools for Wetland Assessment Course

and is currently awaiting the results.

She is a Professional Natural Scientist with the South African Council of Natural Scientific Professions (Pr.Sci.Nat: 009135) for Environmental Sciences.

She is also an active member of the Southern African Society of Aquatic Scientists Registration number (SASAQS Registration number: SASAQS0025) and the South African Bat Assessment Association (Registration number: 0054). She is a member of Bird Life South Africa (BLSA) (SABAP Citizen scientist number: 20686) and BLSA Membership number: 1041760.

Educational Qualifications:

TERTIARY
Institution: University of
Pretoria Course: BSc (Hons)
Zoology Year: 2015 completed
Degree awarded

Institution: University of South Africa
Course: (BSc) Environmental Management, Zoology
Year: 2005-2008
Distinctions: 11 Distinctions
32 Subjects done – Degree Awarded

SECONDARY
Institution: Centurion High School
Subjects passed: Afrikaans (First Language)
HG English (Second Language) HG Natural Science HG Mathematics HG
Geography HG
Art HG

OTHER
Institution: NAUI – Scuba World
Qualification: Scuba Diver

RELEVANT (ENVIRONMENTAL) WORK EXPERIENCE

Business: Enviridi Environmental Consultants (Pty) Ltd
Position: Director / Senior Specialist and Scientist
Ecological specialist work, Environmental Consultant
Year: 2018 till present

Business: M2 Environmental Connections / Prescali Environmental Consultants (Pty) Ltd
Position: Environmental Consultant / Ecological specialist work
Year: 2013-2015

Business: Geo Pollution Technologies (Pty) Ltd. Position: Student work
Delivering and collecting water samples
Environmental impact reports

Business: Onderstepoort – University of Pretoria

Academic Hospital
Clinical Pathology Lab – 3rd Floor
Position: Lab assistant (Voluntary)Laboratory Skills, Basic Hematology, Basic Cytology

TITLE PAGE AND ABSTRACT OF RESEARCH PROJECTS IDENTIFIED IN ACADEMIC RECORD

TAXONOMIC AND FUNCTIONAL DIVERSITY OF ANT SPECIES FOUND IN REHABILITATED AND NATURAL GRASSLANDS
Honours Project Proposal
March 2015

Corlien Lambrechts
Supervisors: Mark Robertson
Centre of Invasion Biology, Department of Zoology and Entomology, University of Pretoria, Pretoria, 0002, South Africa

ABSTRACT

Grasslands are found in all ecoregions in the world and constitute a critically endangered biome with invaluable services to the environment that should not be lost. Bio-indication is a way to analyse the health of an environment by using a key species to infer the state of the habitat. Ants have been successfully used as bio-indicator species in South Africa and Australia. Ant species were sampled in high altitude grasslands in Cathedral Peak, Drakensburg (ca. 2000 m a.s.l) using standard pitfall traps. The species data obtained were assessed in terms of taxonomic and functional diversity. Species diversity, composition and richness between these diverse habitats revealed patterns that characterise ant species found in natural and rehabilitated areas. Morphological traits and measurements were used to distinguish between functional groups and principle component analysis plotted different indicator species in terms of their functional importance. Environmental differences were recorded and assessed in terms of significance between the areas and this correlated with the species data, gave meaningful results. Results showed no significance in terms of richness and diversity, but significant differences in species composition between diverse habitats. Opposed to expectations, predatory and specialised species tended to occur within rehabilitated areas while generalist species seemed to favoured natural areas. It seems that rehabilitated grasslands do not have fewer opportunities than natural grasslands as expected, but rather different opportunities, which seem to be harnessed by an increase in specialised ants. In this study, it was found that both the natural and the rehabilitated grasslands have a unique species composition. Thereby, ants may have merit as bio-indicators, but will respond in terms of community structure, not necessarily in diversity or numbers. Certain indicator species may have more value in terms of interpretation towards the gradual health or rehabilitation of grassland ecosystems as opposed to conventional diversity and richness assessments.

RELEVANT (FULL-TIME) WORK EXPERIENCE SINCE 2015 (after Honors) – 2021: PROJECT DESCRIPTIONS

Latest Ecological work provided first for ease of reference (all Ecological work highlighted in green):

Projects			
Institution Name	**Description**	**Participation**	**Year Completed**
SaOther – Outsourced as Contractor - Enviridi Environmental Consultants (Pty) Lt	Klipspruit - KZN	Specialist Work for – Ecological and Aquatic Ecological assessments	2022
	Windsor Sand Mining	Specialist Work for –Aquatic Ecological assessments	2021
	Rietfontein Mining Permits (3 footprints)	Specialist Work (Fauna and Flora for three (3) BAR Applications	2021
	Two Rivers Platinum - Limpopo	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	Kilo Sands Peach Tree Ext 28 Township	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	Cold Gold – Prospecting Rights	Specialist Work (Fauna and Flora for two (2) BAR Applications	2021
	Kangra Canyon Coal	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	Birmingham Canyon Coal	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	Siding - Canyon Coal	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	AEMFC – Bunkers and West Block	Specialist Work for – Ecological and Aquatic Ecological assessments	2021
	Biomonitoring	Creighton Umgeni Water Supply – Surface water and SASS	2020
	CIM International Sand Mining Permit and Sand Mining Prospecting Right	Riparian Rehabilitation and Work Method Statements	2018/2019
	Monitoring for EastPlats – Eastern Limb	SASS5 Practitioner, Water Quality	2018/2019
	Monitoring for Barplats – Western Limb	SASS5 Practitioner, Water Quality	2018/2019
	Vaalbank Biomonitoring Monitoring	SASS5 Practitioner	2018/2019
	Wykom Siding Water Use License Applications	Wykom Siding – Bi-annual Biomonitoring SASS	2019 till date
	Uitkomst Water Use License Applications	Uitkomst Colliery – Bi-annual Biomonitoring SASS	2019 till date
	Ecological Assessments and Fauna Surveys	Bokoni River Rehabilitation Project – Aquatic Ecology and Ecological Assessment	2021
		Mphahlele Aquatic Ecology, Surface Water and Terrestrial Biodiversity	2021
		Salene PR Right – Ecological Report	2021
		Azaria Chicken Farm - Fauna and Flora Assessment	2021
		Sable Granite Fauna and Flora Assessment	2021

		Mofenyi Vermiculite Mine	2020
		Gilmoe Mining	2020
		N1 Filling Station – Gudani Consulting	2020
		Thaba Chweu Cemetery	2019
		7 Seas	2019
		Nkanyi Lodge	2018/2019
		Kumbelo Mining	2018/2019
		Bokoni Surface water and SASS Biomonitoring	2020
		Bokoni Ecological Impact Assessment	2020
		Kookfontein Mining Right - Faunal Investigation	2020
		Boontjiesfontein Faunal Assessment	2020
		Brentwood Shopping Centre Ecological Impact Assessment	2020
		Zastron Township Development – Ecological Assessment	2020
		Stilfontein Truck Stop Development	2020
		GHB Faunal Assessment – Devondale & Mullershope	2020
		Leeuwfontein Residential Development	2020
		Estate D'Afrique Road Establishment	2018/2019
		Wykom SASS Monitoring – Bi-Annual	2020 - 2021
		Uitkomst SASS Monitoring – Bi-Annual	2020 - 2021
		Mooinooi SASS Monitoring	2020
		Kangra T4 Ecological Assessment	2020 – 2021
		Birmingham Ecological Assessment	2020 - 2021
		Samancor ECM: Lannex and Tweefontein Ecological Assessment	2020
		Samancor WCM: Mooinooi Ecological Assessment	2020
		Salene McCarty Manganese	2020
		Sabie Landfill	2020
		Sefateng Ecological Monitoring	2020
		Russelstone Oil	2018/2019
		Steelpoortdrift Surface water and SASS5	2018/2019
		Wintershoek Ecological Assessment	2018/2019

		Lagersdrift Ecological Assessment	2018/2019
		Smokey Hills Platinum Mine SASS	2018/2019
		Windsor TSF Footprint expansion	2018/2019

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Venetia Update of IWWMP – 2018
Update of IWWMP
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Zwartkoppies Edenvale Townplanning development – 2018
Fieldwork and Ecological report
Location of study: Gauteng
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Glenover Phosphate Ecological Assessment – 2018
Fieldwork and Ecological report
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Glenover Phosphate EIA/EMPR – 2018
Compilation of Environmental Impact Assessment report
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Grassvally WUL Audit – 2018
Compilation of report
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Sylvania Lannex Section 24G Application – 2018
Compilation of Basic Assessment report
Location of study: North west
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Corobrik Basic Assessment – 2018
Compilation of Basic Assessment report
Location of study: Gauteng
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Coastal Fuels External Audit – 2017
Fieldwork and WUL Audit report
Location of study: Mpumalanga
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Sefateng specialist investigation (Ecology) amendments for expansion – 2017
Fieldwork and Compiled Ecological reports for expansion of current infrastructure
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Moeijelijk specialist investigation (Ecology) amendments for expansion – 2017
Fieldwork and Compiled Ecological reports for expansion of current infrastructure
Location of study: Limpopo

Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Bauba Northern, Central and Southern Cluster Ecology team – 2017
Fieldwork and Compiled Ecological reports for Northern, Southern and Central Clusters
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Black Chrome Pre-feasibility, Due Dilligence and Feasibility – 2017 -2018
Compiled EIA/EMPR, Compiled EIA/EMPR for Smokey Hills Platinum Mine and BAR for servitude
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Matutu Clay Environmental authorisation amendments - 2016
Compiled EIA/EMPR
Location of study: North west
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: York, Kudumane Manganese Closure - 2016
Compiled Closure report and Audit
Location of study: Northern Cape
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Hakskeenpan Ecology specialist investigation - 2016
Compiled Ecological report and fieldwork
Location of study: Northern Cape
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd -2016
Project: Apollo Brick External WUL Audit
Compiled report
Location of study: North west
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd - 2016
Project: Illitha Stellite EMPR Amendment and IWWMP for WUL Amendment
Compiled report
Location of study: North west
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Pan Palladium Ecological Reports (Ironveld Holdings (Pty) Ltd) – 2015
Ecological Report and Fieldwork
Location of Study: Limpopo
Under supervision of Ms. Elaine van der Linde and Dr Petro Erasmus

Company: M2 Environmental Connections cc
Project: Transalloys Wetland assessment near Witbank for Savannah Environmental (Pty) Ltd) – 2015
Compiled official wetland report and fieldwork
Under supervision and review of Mr. Johan Maré

Company: M2 Environmental Connections cc
Project: Moeijelik Fauna Ecological Report (2015)
Responsible for Fauna Assessment and Field work
Location of study: Limpopo
Under supervision and review of Dr Petro Erasmus

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Mecklenburg EMPR Audit
Compiled report

Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Pan Palladium EIA/EMPR Iron Ore and Pan Palladium EIA/EMPR PGE – 2015
Compiled reports for PGE and Iron Ore
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Epibex Prospecting BAR/EMP – 2015
Compiled report
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

Company: Prescali Environmental Consultants (Pty) Ltd
Project: Grasvally Project: Sylvania Platinum EIA/EMPR – 2015
Compiled report
Location of study: Limpopo
Under supervision of Dr Petro Erasmus and Ms. Elaine van der Linde

PREVIOUS POST BSC GRADUATE PROJECTS (2013-2014)

Company: Menco cc.
Project: Aurora Power Solutions: Hydrological Assessment - April 2013)
Compiled Stormwater Report for Surface Water assessment
Location of study: Northern Cape
Under supervision and review of Mr. Johan Mare

Company: Menco cc.
Project: Department of Water Affairs: Integrated Water and Resource Management Plan FOR HARTIES: KURPER OORD - June 2013
Compiled official report
Location of study: North West Province
Under supervision and review of Mr. Johan Mare

Company: Menco cc.
Project: Destiny Springs Investment (Pty) Ltd: Fauna & Flora Investigation - July 2013
Responsible for Fauna Assessment and Field work
Location of study: Limpopo, Thabazimbi Area
under supervision and review of Mr. Johan Mare

Company: Menco cc.
Project: Prescali (Pty) Ltd: Aquatic & Wetland Assessment - August 2013
Compiled Official Report
Location of study: Limpopo, Harriet's Wish
under supervision and review of Mr. Johan Mare

Company: Menco cc.
Project: Eco Elementum (Pty) Ltd: Fauna & Flora Assessment - October 2013
Responsible for Fauna Assessment and Field work
Location of study: Mpumalanga, Pullens Hope
under supervision and review of Mr. Johan Mare

Company: Menco cc.
Project: Department of Public Works: Ekuseni Youth Centre: Wetland Rehabilitation and Management Report Compiled - September 2013
Compiled official report

UNISA

UNIVERSITY OF SOUTH AFRICA

We certify that

Corlien Bekker

having complied with the requirements of the Higher Education Act

and the Institutional Statute, was admitted to the degree of

BACHELOR OF SCIENCE

with specialisation in Environmental Management: Zoology Stream

at a congregation of the University

on 20 April 2009

Vice-Chancellor

Executive Dean

University Registrar

23052890

University of Pretoria

The Council and Senate hereby declare that
at a congregation of the University the degree

Bachelor of Science Honours
in
Zoology

with all the associated rights and privileges was conferred on

Corlien Lambrechts

in terms of the Higher Education Act, 1997 and the
Statute of the University

2013 -06- 07

On behalf of the Council and Senate

C. de la Rey

Vice-Chancellor and Principal

N. Smit

Registrar

00023382

2016-04-18

IMBEWU

Sustainability Legal Specialists (Pty) Ltd

CERTIFICATE

This is to certify that

Corlien Lambrechts
(Prescali Environmental Consultants (Pty) Ltd)

attended the "Financial Provision Regulations & Mine Closure Requirements Legal Training Workshop" at IMBEWU's Offices in Johannesburg on 7 June 2016

Alistair Young
Senior Sustainability Legal Consultant

Samantha de Villiers
Sustainability Legal Consultant

NATIONAL AQUATIC ECOSYSTEM HEALTH MONITORING PROGRAMME

Water and Sanitation

Environment Affairs

Water Research Commission

CERTIFICATE OF ACCREDITATION

This is to certify that

Corlien Lambrechts

has met the requirements of the
River Health Programme as a SASS5 Practitioner

COMPETENCY IN THE FOLLOWING AREAS HAVE BEEN DEMONSTRATED:

UNDERSTANDING OF THE SCOPE AND APPLICATION OF THE SASS5 METHOD.

DEMONSTRATION OF THE CORRECT SAMPLING PROTOCOLS

DEMONSTRATION OF THE CORRECT SAMPLE PREPARATION PROTOCOLS

IDENTIFICATION OF AQUATIC MACROINVERTEBRATES

COMPETENCY IS VALID FOR 3 YEARS FROM CERTIFICATE DATE

NATIONAL SASS5 AUDITOR

28 September 2018
DATE

NATIONAL AQUATIC ECOSYSTEM HEALTH MONITORING PROGRAMME

Water and Sanitation

Water Research Commission

CERTIFICATE OF ACCREDITATION

This is to certify that

Corlien Lambrechts

has met the requirements of the
River Health Programme as a SASS5 Practitioner

COMPETENCY IN THE FOLLOWING AREAS HAVE BEEN DEMONSTRATED:

UNDERSTANDING OF THE SCOPE AND APPLICATION OF THE SASS5 METHOD.

DEMONSTRATION OF THE CORRECT SAMPLING PROTOCOLS

DEMONSTRATION OF THE CORRECT SAMPLE PREPARATION PROTOCOLS

IDENTIFICATION OF AQUATIC MACROINVERTEBRATES

COMPETENCY IS VALID FOR 3 YEARS FROM CERTIFICATE DATE

NATIONAL SASS5 AUDITOR

30 September 2021

DATE

www.imbewu.co.za

IMBEWU

Sustainability Legal Specialists (Pty) Ltd

CERTIFICATE OF ATTENDANCE

This is to certify that

Corlien Lambrechts
Enviridi Environmental Consultants

attended the "Environmental Law Update Workshop" at IMBEWU's Offices in Johannesburg on 29 October 2019

The course consists of 1 SACNASP CPD Point
(validation number: 2018-0021-000397)

Alistair Young
Senior Sustainability
Legal Consultant

SACNASP
South African Council for Natural Scientific Professions

Accredited by the South
African Council for Natural
Scientific Professions

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Corlien Lambrechts

Registration Number: 009135

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **25 January 2017** Expires **31 March 2022**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

EAPASA
Unit 19 Oxford Office Park
3 Bauhinia Street
Highveld Techno Park
Centurion
0157
Tel. (+27) 12 880 2154

Email: registrar@eapasa.org / Website: www.eapasa.org

Environmental Assessment Practitioners Association of South Africa
Advancing environmental assessment practice in South Africa

Ms Corlien Lambrechts
20 Faith Hills, Bush street
Willow Park Manor
Pretoria
0018

Sent by email to: lcorlien@gmail.com

Dear Ms Lambrechts

Registered Environmental Assessment Practitioner: Number 2020/935
Corlien Lambrechts : South African ID 8412040017088

The Environmental Assessment Practitioners Association of South Africa (EAPASA) herewith certifies that Corlien Lambrechts is a Registered Environmental Assessment Practitioner (EAP) in accordance with the prescribed criteria of Regulation 15.(1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Your registration is duly authorised by EAPASA as the single Registration Authority for EAPs in South Africa (appointed as per Regulation No. 104, Gazette No. 41434 of 8 February 2018, in terms of section 24H(3)(a) of the NEMA). Your status as a Registered EAP is displayed in the 'EAP Register' - please find your name and contact email address at

https://registration.eapasa.org/registered-practitioners

Your registration is effective for a period of five years from 07 February 2020, and expires on 07 February 2025. The renewal of your registration in 2025 will be contingent on you having met the requirements of EAPASA's Continuing Professional Development (CPD) policy during each year of registration.

As a Registered EAP you are required to uphold the EAPASA Code of Ethical Conduct and Practice in your professional endeavours, towards the goal of quality assurance in environmental assessment practice.

Please accept my congratulations on your registration.

Best regards

RCHill

Dr Richard Hill
Registrar
Date: 07 February 2020

RHODES UNIVERSITY

Where leaders learn

DEPARTMENT OF GEOGRAPHY

TOOLS FOR WETLAND ASSESSMENT

This is to certify that

CORLIEN LAMBRECHTS

has attended
and demonstrated his/her competence
in the above course.

W. Ellery

Course Director

A L Moodley

Registrar

Location of study: Newcastle, Kwa-Zulu Natal
under supervision and review of Dr. Petro Erasmus

Company: Menco cc.
Project: Department of Public Works· NCOME and Management Report Compiled: Wetland Rehabilitation
Compiled official report - 2013
Location of study: Vryheid, Kwa-Zulu Natal
under supervision and review of Dr. Petro Erasmus

Company: Menco cc.
Project: Samancor Chrome· Eastern Chrome Rehabilitation Plan & Monitoring Programme - Lwala Section Riparian
Compiled official reports - 2013
Location of study: Limpopo Province
under supervision and review of Dr. Petro Erasmus

Company: Envirokonsult cc.
Project: Contractual Work as part of Usuthu-Vaal Water Management (Biomonitoring and Sampling at Heyshope Dam (April - September 2009)
Assisting with Biomonitoring, SASS and Surface Water Samples
Location of study: Mpumalanga
under supervision of Mr. Kobus du Plessis

LIST OF PROJECTS COMPLETED

- Hydrocensus for Geohydrological Report (Bela Bela): Geo Pollutions Technology (Pty) Ltd
- Aurora Power Solutions Project: Storm water Management as part of Hydrological
- Evaluation for Padrooi Solar Facility
- Adams Solar: Adams Phase 1, Phase 2 and Phase 3 (Aurora Power Solutions)
- Sirius Solar PV Facility (Aurora Power Solutions (Pty) Ltd)
- AfriSam Water Use License Applications (Pietermaritzburg & Umlaas Open pit quarries)
- Vlakpoort Fauna Impact Assessment (Fauna & Flora Study conducted in Thabazimbi, Limpopo)
- Eukuseni Rehabilitation team and assessments
- Ncome Rehabilitation team and assessments
- Harriet's Wish PGE Wetland & Aquatics Assessment
- Pullenshope Ecological Impact Assessment (Fauna & Flora Study conducted near Hendrina, Mpumalanga) (Eyethu Coal)
- Pullenshope Water Use License Authorisations (Eyethu Coal)
- Coastal Fuels (Pty) Ltd: Droogvallei and Witkranz rehabilitation team
- Vunene Mining 1000 hectares Ecological Fieldwork and Management proposals report (Vunene Usutu Mining)
- Vunene IWWMP compilation
- Pan Palladium Ecological Reports (Ironveld Holdings (Pty) Ltd), (Pan Palladium SA (Pty) Ltd Ecological field work and assessments
- IFMSA Pipeline and Samancor WCM: Red data Fauna Assessment
- Pan Palladium EIA/EMP: Altona Smelter
- Pan Palladium EIA/EMP: Iron Ore (Sylvania projects)
- Pan Palladium EIA/EMP: PGMs (Sylvania projects)
- Wilgespruit: Ruimsig Authorisations (Savannah Environmental (Pty) Ltd) and WUL
- Volspruit Project: Sylvania Platinum IWWMP, Proposed Flood Berm Rehabilitation
- Transalloys Wetland assessment near Witbank (Savannah Environmental (Pty) Ltd)
- Moeijelijk Fauna Ecological Report

- Mechlenburg EMPR Audit
- Pan Palladium DMR EIA/EMPR Iron Ore
- Pan Palladium DMR EIA/EMPR PGE
- Epibex Prospecting BAR/EMP
- Grasvally Project: Sylvania Platinum EIA/EMPR
- Avelar Gransolar S.L EMP
- Illitha Stellite EMPR Amendment and IWWMP for WUL Amendment
- Andalusite Resources External WUL Audit
- Apollo Brick External WUL Audit
- Hakskeenpan Ecology specialist investigation
- York, Kudumane Manganese Closure
- Matutu Clay Environmental authorisation amendments
- Nkomazi Safari Hotel (Crocodile River Ecology adjacent Kruger National Park)
- Black Chrome Pre-feasibility, Due Dilligence and Feasibility studies
- Bauba Northern, Central and Southern Cluster Ecology team
- Moeijelijk specialist investigation (Ecology) amendments for expansion
- Sefateng specialist investigation (Ecology) amendments for expansion
- Black Chrome Servitude Development Authorisations
- Black Chrome Mine EIA/EMP, Black Chrome WUL and RSIP
- Smokey Hills Platinum Mine EIA/EMP Amendment
- Coastal Fuels External Audit
- Corobrik Basic Assessment Reports (BAR/EMP)
- Sylvania Lannex Section 24G Rectification Process
- Grasvally WUL Audit
- Glenover Phosphate Specialist investigation (Ecology) and EIA/EMP
- Zwartkoppies Ecological work for townplanning development
- Venetia Update of Integrated Water and Waste Management Plan

Ecological Projects:

- Bokoni River Rehabilitation Project – Aquatic Ecology and Ecological Assessment
- Mphahlele Aquatic Ecology, Surface Water and Terrestrial Biodiversity
- Salene PR Right – Ecological Report
- Azaria Chicken Farm - Fauna and Flora Assessment
- Sable Granite Fauna and Flora Assessment
- Mofenyi Vermiculite Mine Terrestrial Biodiversity
- Gilmoe Mining Terrestrial Biodiversity
- N1 Filling Station – Gudani Consulting Terrestrial Biodiversity
- Thaba Chweu Cemetery Terrestrial Biodiversity
- 7 Seas Terrestrial Biodiversity
- Nkanyi Lodge Terrestrial Biodiversity
- Kumbelo Mining Terrestrial Biodiversity
- Bokoni Surface water and SASS Biomonitoring
- Bokoni Ecological Impact Assessment
- Kookfontein Mining Right - Faunal Investigation
- Boontjiesfontein Faunal Assessment
- Brentwood Shopping Centre Ecological Impact Assessment
- Zastron Township Development – Ecological Assessment
- Stilfontein Truck Stop Development – Ecological Assessment
- GHB Faunal Assessment – Devondale & Mullershope
- Leeuwfontein Residential Development – Ecological Assessment
- Estate D'Afrique Road Establishment – Ecological Assessment
- Wykom SASS Monitoring – Bi-Annual
- Uitkomst SASS Monitoring – Bi-Annual
- Mooinooi SASS Monitoring
- Kangra T4 Ecological Assessment
- Birmingham Ecological Assessment
- Samancor ECM: Lannex and Tweefontein Ecological Assessment

- Samancor WCM: Mooinooi Ecological Assessment
- Salene McCarty Manganese – Desktop Ecological Assessment
- Sabie Landfill – Desktop Ecological Assessment
- Sefateng Ecological Monitoring
- Russelstone Oil – Ecological Assessment
- Steelpoortdrift Surface water and SASS5
- Wintershoek Ecological Assessment
- Lagersdrift Ecological Assessment
- Smokey Hills Platinum Mine SASS
- Windsor TSF Footprint expansion
- Klipspruit KZN Ecological Specialist work
- Wykom Siding – Bi-annual Biomonitoring SASS
- Uitkomst Colliery – Bi-annual Biomonitoring SASS
- CIM International Sand Mining Permit and Sand Mining Prospecting Right
- Monitoring for EastPlats – Eastern Limb
- Monitoring for Barplats – Western Limb
- Vaalbank Biomonitoring Monitoring
- Creighton Umgeni Water Supply – Surface water and SASS
- Klipspruit – KZN Aquatic and Ecological (Fauna and Flora Assessment)
- Windsor Sand Mining Aquatic Ecological Assessment
- Rietfontein Mining Permits (3 footprints) – Terrestrial Biodiversity Assessment
- Two Rivers Platinum – Limpopo - Aquatic Ecology and Terrestrial Biodiversity
- Kilo Sands Peach Tree Ext 28 Township - Aquatic Ecology, Surface Water and Terrestrial Biodiversity
- Cold Gold – Prospecting Rights - Aquatic Ecology, Surface Water and Terrestrial Biodiversity
- Kangra Canyon Coal - Aquatic Ecology and Terrestrial Biodiversity
- Birmingham Canyon Coal - Aquatic Ecology and Terrestrial Biodiversity
- Siding - Canyon Coal - Aquatic Ecology and Terrestrial Biodiversity
- AEMFC – Bunkers and West Block - Aquatic Ecology and Terrestrial Biodiversity.

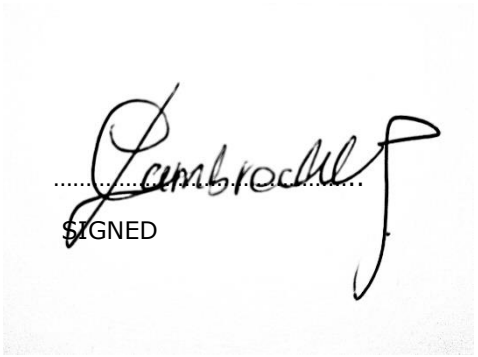
EVIDENCE OF THE APPLICATION OF THE BASIC SCIENTIFIC PRINCIPLES, METHODS AND TECHNIQUES, SCIENTIFIC OBSERVATION, DISCUSSION AND INTERPRETATION WHERE A SCIENTIFIC OPINION IS DELIVERED AND EXPLAINED IN SCIENTIFIC TERMS

- All reports were conducted within the framework of Scientific Methodology applied
- Relevant Legislation were considered within documents, including:
  - National Water Act, 1998 (Act 36 of 1998)
  - NEMA: National Environmental Management Act, 1998 (Act 107 of 1998)
  - NEMWA: National Environmental Waste Act, 2008 (act 59 of 2008)
  - NEMBA: National Biodiversity Act,
  - LEMA: Limpopo Environmental Management Act,
- Databases used for guidance and tools:
  - SANBI Database
  - GIS Spatial Analysis (PlanetGIS, Quantum GIS Software)
  - FEPA Database
  - Screening Tool – Species Assessments
  - Latest Species Regulations as issued October 2020 and finalized in 2021.
- Fieldwork techniques were applied for ecological work done by the candidate.
  - Wetlands: Plant identification, Ecoservices determination, auguring (Completed Rhodes University 2021 Wetland Course – awaiting results;
  - Fauna: Photographs, tracking of spoor, droppings, other field work techniques similar;
  - to those used by other experts in the field, such as transects and sampling design;
  - Flora: Plant identification, sampling and collecting specimens for off-site identification.

- Riparian: Identification of river morphology, riparian plants and faunal species;
- Fauna trapping, software data manipulation to determine diversity and statistically
- determine indexes was done by the candidate in undergraduate degree as well as post; and
- Graduate degree awarded in 2015 by the University of Pretoria;
- The graduate has worked full-time during the Honours degree (2015) and has been working till date (June 2018) within the field of Ecology and Environmental Sciences.
- She has been registered as a Candidate Natural Scientist (After completion of Honours degree) with SACNASP and a Certified Natural Scientist before completion of her Honours degree.
- Upgraded to Pr.Sci.Nat for Environmental Sciences.

I, …Corlien Lambrechts (full name), with ID No. …8412040017088

do hereby state that I personally compiled this Work Experience Report and that it is an honest reflection of my work experiences to date.



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SIGNED

NICOLE UPTON

ENVIRONMENTAL CONSULTANT / ENVIRONMENTAL ASSESSMENT PRACTITIONER

CONTACT

079 555 2433
nicole@redkiteconsulting.co.za
https://redkiteconsulting.co.za/

EDUCATION

B.Sc. Environmental management (Cum Laude)

2012
University of South Africa (UNISA)

B.Sc. (Hons) Animal, Plant and Environmental Science

2017
University of Witwatersrand

PROFESSIONAL AFFILIATIONS

- SOUTH AFRICAN COUNCIL FOR NATURAL SCIENTIFIC PROFESSIONS (SACNASP)
  (Registration Number: 121030)
- WATER INSTITUTE OF SOUTHERN AFRICA (WISA)
  (Membership no: 39243)
- INTERNATIONAL ASSOCIATION FOR IMPACT ASSESSMENTS (IAIASA)
- (No. 6185)

PROFILE

Ms. Nicole Upton has 12 years working experience as an Environmental Consultant, Environmental Assessment Practitioner (EAP) and specialist. She specialises in Environmental Management and Analysis, Environmental Authorisations and Botany. Ms. Upton has obtained a B.Sc. (Hons) in Animal, Plant and Environmental Sciences and currently holds the position of Director at Red Kite Environmental Solutions.

Nicole started her career in the environmental field in 2011 as a junior environmental consultant. Since then Nicole has gained extensive experience in environmental monitoring, rehabilitation, environmental authorisations, vegetation assessment and environmental impact assessment. Her main focus is the mining industry and has worked with various project teams, often as project manager.

She has undertaken various Environmental Impact Assessments, ecology studies, surface water assessments, rehabilitation plans, Water Use License Applications, Integrated Water and Waste Management Plans, Waste Management License Applications and Alien Invasive Plant Management Plans.

RELEVANT EXPERIENCE

Red Kite Environmental Solutions (Pretoria)

2017 - present
Nicole is currently the Director of Red Kite Environmental Solutions and practices as an Environmental Assessment Practitioner. Nicole continues to specialise in rehabilitation and flora studies and assessments.

She is also a member of the International Association for Impact Assessment (IAIAsa) as well as the Water Institute of South Africa (WISA).

M2 Environmental Connections (Pretoria)

2014 - 2017
Nicole started at Menco in 2014 as an Environmental Consultant where she gained further experience in Water Use Licence Applications, GIS, Ecological Assessments, Surface Water Assessments, Water Balances as well as rehabilitation. This experience has been filled out with various relevant workshops and courses.

During 2015 Nicole was promoted to a management position where she was responsible for a team and successfully managed and completed various

SKILLS

- ENVIRONMENTAL AUTHORISATION APPLICATIONS
- IMPACT ASSESSMENTS
- ENVIRONMENTAL LEGISLATION
- VEGETATION / FLORA STUDIES
- REHABILITATION
- MONITORING
- GIS AND MAPPING

projects for high profile clients/companies (e.g. Eskom, Sasol, Samancor and AfriSam). Among her other duties, she liaised with specialists and government institutions and ensured that staff and sub-contractors performed their duties.

Izimbali Environmental Consultants (Pretoria)

2011 - 2014

Nicole started as a Junior Environmental Consultant at Izimbali Environmental Consultants. During her time with Izimbali she gained invaluable experience in the field of botany, conducting flora specialist studies and impact assessments as well as conducting Basic Assessments.

Training and Workshops

- Environmental Impact Assessment (EIA) 2014 Legal Regime Workshop
- Practical Implementation of Environmental Law and Recent Legislative Developments
- IWRM, the NWA, and Water Use Authorisation, Focusing on WULAs

PROJECTS

Environmental Authorisations

Year	Client	Project	Authorisation
Year	Client	Project	Specialist study
2013	Eskom	Dwaalboom C&C	Basic Assessment Process
2014	JT Group Developments	Kirkney X33 Residential Development	IWULA
2014	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine Small Scale Mining	General Authorisation (NWA)
2014	Crimson King Properties 74	Mogale Ext. 10 commercial and residential development	IWULA
2014	Thesen Island Property Holdings	Donkerhoek Industrial Park development	IWULA
2014	Sedibeng Brewery	Sedibeng Brewery	IWULA
2014	AfriSam SA	Ulco Quarry	IWULA
2014	Equilibrium Trading 29	Zwavelpoort light industrial development	General Authorisation (NWA)
2014	N4 Trucks	Pienaarspoort X18 Industrial Development	IWULA
2015	Gauteng Department of Human Settlements	Fort West Residential Development	IWULA
2015	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine Mining Right (full scale mining)	Scoping and EIA Process
2015	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine Mining Right (full scale mining)	IWULA
2015	Corridor Mining Resources SOC	Twyfelaar Chrome Mine	General Authorisation (NWA)
2015	Corridor Mining Resources SOC	Twyfelaar Chrome Mine	IWULA
2015	AfriSam SA	Pietermaritzburg Quarry	IWULA
2015	Sefateng Chrome Mine	Sefateng Chrome Mine	IWULA
2017	Eco Elementum	Yoctolux Collieries: Mooifontein Mine	IWULA
2017	NAO Agencies	Centurion Country Club	WULA
2017	Bauba Resources	Bauba Platinum Farms Mining Project	Scoping and EIA Process
2017	Bauba Resources	Bauba Platinum Farms Mining Project	IWULA
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine (opencast expansion)	IWULA
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine (opencast expansion)	Scoping and EIA Process
2017	Eco Elementum	Madini Mining: Doornrug Colliery	IWULA
2017	Eco Elementum	Londani Coal: Nndanganeni Colliery	IWULA
2017	Sefateng Chrome Mine	Sefateng Chrome Mine (opencast expansion)	Scoping and EIA Process
2018	K2018010724 (South Africa)	Rhenosterkop Prospecting Right	Basic Assessment Process
2019	K2018010850 (South Africa)	Brits Crocodile River Prospecting Right Project	Basic Assessment Process
2019	K2018010819 (South Africa)	Bandelierskop Prospecting Right Project	Basic Assessment Process
2019	K2018368290 (South Africa)	Wintershoek Prospecting Right Project	Basic Assessment Process
2018	K2018368290 (South Africa)	Rietvalley Prospecting Right Project	Basic Assessment Process
2018	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine: Brakfontein Underground Expansion Project	Scoping and EIA Process
2019	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Protected Tree Permit
2019	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine (tailings backfill project)	Scoping and EIA Process
2019	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine: Groundwater abstraction project	WULA

Environmental Authorisations

Year	Client	Project	Authorisation
2019	Density Prospecting	Lagersdrift Prospecting Right	Basic Assessment Process
2020	Hall Core Water	Moeijelijk Mine Water Supply	WULA
2018	Hall Core Water	Sefateng Chrome Mine Water Supply	WULA
2019	Vanadium Resources	Steelpoortdrift Mine	IWULA
2018	Sefateng Chrome Mine	Sefateng Chrome Mine (opencast expansion)	IWULA
2019	Sefateng Chrome Mine	Sefateng Chrome Mine	Protected Tree Permit
2021	Practara	Nuco Chrome Bophuthatswana: Kookfontein Mine	IWULA
2021	Practara	Nuco Chrome Bophuthatswana: Kookfontein Mine	Scoping and EIA Process
2021	Practara	Nuco Chrome Bophuthatswana: Kookfontein Mine	General Authorisation (NWA)
2021	Bauba Resources	Nuco Chrome Bophuthatswana: Kookfontein Mine	General Authorisation (NWA)
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	IWULA
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	Basic Assessment Process
2021	Elemental Sustainability	South32 Mine: Lahlaka Village Resettlement Project	Basic Assessment Process
2021	Ervoplex	Leeuwfontein Residential Development	WULA
2021	Ervoplex	Leeuwfontein Residential Development	Basic Assessment Process
2020	MTC Mining	Mphahlele Chrome Mine	WULA
2021	Southern Sphere	Kingfisher and Sunbird Mining Project	IWULA
2021	Southern Sphere	Kingfisher and Sunbird Mining Project	Scoping and EIA Process
2020	K2018010850 (South Africa)	Hartebeestfontein Remainder Prospecting Right	Basic Assessment Process

Vegetation Assessments

Year	Client	Project	Specialist study
2011 & 2012	Eskom	Vegetation survey in 25 Sappi and Komatiland plantations	Vegetation survey
2013	Eskom	Leeupoort powerline route	Vegetation survey
2013	Eskom	Villa-nora - Beauty Powerline	Vegetation Study
2014	Rietspruit Crushers	Rietspruit Crushers	AIP Management Plan
2014	International Ferro Metals (SA)	Pipeline between IFM (SA) and Samancor: Western Chrome Mines	Terrestrial Ecology Study
2014	Rietspruit Crushers	Rietspruit Crushers	Terrestrial Ecology Study
2016	Sedibeng Brewery	Sedibeng Brewery	AIP Management Plan
2015	Samancor	Eastern Chrome Mines: Ferrometals AIP Control Plan	AIP Management Plan
2015	Samancor	Western Chrome Mines: Buffels East	AIP Management Plan
2015	Samancor	Western Chrome Mines: Buffels West	AIP Management Plan
2015	Samancor	Western Chrome Mines: Elandsdrift	AIP Management Plan
2015	Samancor	Western Chrome Mines: Millsell	AIP Management Plan
2015	Samancor	Western Chrome Mines: Waterkloof	AIP Management Plan
2015	Samancor	Western Chrome Mines: Mooinooi	AIP Management Plan
2015	Destiny Springs Investment 11	Vlakpoort Iron Ore Mine development	Protected tree survey
2015	Sylvania Platinum	Grasvally and Zoetveld Chrome Mine	Vegetation Study
2015	Samancor	Eastern Chrome Mines: Doornbosch	Flora identification
2015	Samancor	Eastern Chrome Mines: Lannex	Flora identification
2015	Samancor	Eastern Chrome Mines: Steelpoort	Flora identification
2015	Samancor	Eastern Chrome Mines: Winterveld	Flora identification
2015	Bakgatla ba Kgafela Investments and Resources (Pty) Ltd	Mining Development on the farm Nooitgedacht 11 JQ, Limpopo Province	Terrestrial Ecology Study
2015	Vunene Mining	Usutu Colliery	Vegetation survey
2016	Bloodhound SSC	Hakskeen Pan Speed Events Facilities	Vegetation Study
2017	Prescali Environmental Consultants	Meadowhurst	Vegetation Study
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	AIP Management Plan
2018, 2020	Disbergen Property Investments	Nooitgedacht Sand Quarry	AIP Management Plan
2018	Enviroroots	Serenity Memorial Park	Flora Assessment
2019	Enviroroots	Molare Piggery	Flora Assessment
2018	Prescali Environmental Consultants	7 Seas Capital Ventures (Pty) Ltd: Mining Permit	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	Black Chrome Mine	AIP Management Plan
2018	Prescali Environmental Consultants	"Corobrik (Pty) Ltd: Driefontein	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	Kumbelo Mine	Terrestrial Ecology Study
2018	Prescali Environmental Consultants	Palmietfontein Mining Permit	Vegetation Study
2018	Prescali Environmental Consultants	Rooderand	Vegetation Study
2019	Prescali Environmental Consultants	Smokey Hills Platinum Mine: UG1 Outcrop	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	Thaba Chwue Cemetery	Terrestrial Ecology Study

Vegetation Assessments

Year	Client	Project	Specialist study
2018	Prescali Environmental Consultants	Zwartkopjies Integrated and Mixed Use Township	Vegetation Study
2019	Prescali Environmental Consultants	"Highly Blue Trading (Pty) Ltd:	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	"Phoenix Platinum Mining (Pty) Ltd	Vegetation Study
2019	Prescali Environmental Consultants	Nkanyi Lodge	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	Windsor TSF expansion project	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	Windsor TSF expansion project	Vegetation Study
2018	Prescali Environmental Consultants	Highly Blue Trading (Pty) Ltd: Schaapkraal Prospecting Right	Terrestrial Ecology Study
2019	Prescali Environmental Consultants	"Estate D'Afrique:	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Samancor ECM: Tweefontein	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Samancor ECM: Lannex	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Sabie Landfill Site	Terrestrial Ecology Study
2019	RussellStone Protein and Elangeni Oil	RussellStone Protein and Elangeni Oil	Terrestrial Ecology Study
2018	Sefateng Chrome Mine	Sefateng Chrome Mine	AIP Management Plan
2019	Sefateng Chrome Mine	Sefateng Chrome Mine	Biodiversity Action Plan
2019	Sefateng Chrome Mine	Sefateng Chrome Mine	Protected tree survey
2021	Practara	Nuco Chrome Bophuthatswana: Kookfontein Mine	Terrestrial Ecology Study
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	Biodiversity Action Plan
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	Terrestrial Ecology Study
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	Biodiversity Monitoring
2021	Elemental Sustainability	Kangra Coal: T4 Mining Project	Terrestrial Ecology Study
2021	Elemental Sustainability	Canyon Resources: Birmingham Mining Project	Terrestrial Ecology Study
2021	Elemental Sustainability	Kilo Sands	Terrestrial Ecology Study
2021	Elemental Sustainability	Welgedacht Siding	Terrestrial Ecology Study
2021	Elemental Sustainability	Two Rivers Platinum Mine	Terrestrial Ecology Study
2021	Elemental Sustainability	South32 Mine: Lahlaka Village Resettlement Project	Terrestrial Ecology Study
2020	Enviridi	Zastron Residential Development	Flora Assessment
2020	Enviridi	Stilfontein Truckstop	Flora Assessment
2021	Enviridi	Cold Gold	Flora Assessment
2020	Enviroroots	Boontjieskraal Piggery	Flora Assessment
2021	Enviroroots	GHB Rooipoort	Flora Assessment
			Flora Assessment
2021	Prescali Environmental Consultants	AEMFC: Vlakfontein	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Salene Manganese: Macarthy Mine	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Samancor WCM: Mooinooi	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Samancor WCM: Mooinooi	Riparian Vegetation Assessment
2020	Prescali Environmental Consultants	Mofenyi Mining	Terrestrial Ecology Study
2020	Prescali Environmental Consultants	Gilmoe Mining	Terrestrial Ecology Study

Surface Water Assessments and Water Balances

Year	Client	Project	Specialist study
2014	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine Small Scale Mining	Water Balance
2014	Corridor Mining Resources	Fumani Gold Mine	Surface Water Assessment
2014	Corridor Mining Resources	Fumani Gold Mine	Water Balance
2014	Sedibeng Brewery	Sedibeng Brewery	Water Balance
2014	AfriSam SA	Ulco Quarry	Water Balance
2015	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine Mining Right (full scale mining)	Surface Water Assessment
2015	Corridor Mining Resources SOC	Twyfelaar Chrome Mine	Water Balance
2015	AfriSam SA	Coedmore Quarry	Water Balance
2016	Samancor	Millsell and Waterkloof	Water Conservation and Demand Management
2016	AfriSam SA	Ferro operation	Water Balance
2016	Sedibeng Brewery	Sedibeng Brewery	Water balance
2016	AfriSam SA	Eikenhof Quarry	Water Balance
2016	AfriSam SA	Rooikraal Quarry	Water Balance
2016	Chevron South Africa	Milly's Star Stop Waste Water Treatment Works	Water Balance
2016	Samancor	Mooinooi	Water Conservation and Demand Management
2017	Gauteng Department of Human Settlements	Fort West Residential Development	Riparian delineation

Surface Water Assessments and Water Balances

Year	Client	Project	Specialist study
2019	Ecological Fields	D432 Bypass Road Re-Alignment Project	Surface Water Assessment
2019	Eco Elementum	Ngwenya Lodge	Surface Water Assessment
2017	Prescali Environmental Consultants	Black Chrome Mine	Surface Water Assessment
2018	Prescali Environmental Consultants	"Corobrik (Pty) Ltd: Driefontein	Surface Water Assessment
2018	Prescali Environmental Consultants	Glenover Phosphate Project	Surface Water Assessment
2019	Prescali Environmental Consultants	Smokey Hills Platinum Mine: UG1 Outcrop	Surface Water Assessment
2018	Onicalite	Clydesdale Colliery	Surface Water Assessment
2019	Vandaspark	Rondevly Colliery Mining Right	Surface Water Assessment
2019	Vandaspark	Rondevly Colliery Mining Right	Water Balance
2018	Vandaspark	Rondevly Colliery Mining Permit	Surface Water Assessment
2018	Vandaspark	Rondevly Colliery Mining Permit	Water Balance
2018	REC Services	Welgedacht Colliery	Surface Water Assessment
2018	REC Services	Welgedacht Colliery	Water Balance
2019	REC Services	Silverton Automotive SEZ	Surface Water Assessment
2021	Practara	Nuco Chrome Bophuthatswana: Kookfontein Mine	Water Balance
2020	Elemental Sustainability	Wykom Siding	Water Balance
2020	Elemental Sustainability	Wykom Siding	Surface Water Assessment
2020	Elemental Sustainability	Uitkomst Colliery	Water Balance
2020	Elemental Sustainability	Uitkomst Colliery	Surface Water Assessment
2021	Elemental Sustainability	Kangra Coal: T4 Mining Project	Surface Water Assessment
2021	Elemental Sustainability	Canyon Resources: Birmingham Mining Project	Surface Water Assessment
2021	Elemental Sustainability	Kilo Sands	Surface Water Assessment
2021	Elemental Sustainability	Welgedacht Siding	Water Balance
2021	Elemental Sustainability	Welgedacht Siding	Surface Water Assessment
2021	Elemental Sustainability	Two Rivers Platinum Mine	Surface Water Assessment
2021	Elemental Sustainability	Two Rivers Platinum Mine	Water Balance
2021	Prescali Environmental Consultants	AEMFC: Vlakfontein	Surface Water Assessment

Rehabilitation

Year	Client	Project	Specialist study
2014	JT Group Developments	Kirkney X33 Residential Development	Rehabilitation Plan
2015	Crimson King Properties 75	Mogale Ext. 10 commercial and residential development	Rehabilitation Plan
2015	Gauteng Department of Human Settlements	Fort West Residential Development	Rehabilitation Plan
2015	Sasol Mining	Ipumelo Mine	Rehabilitation Assessment
2015	Phoenix Platinum Mine	Phoenix Platinum Mine	Rehabilitation Plan
2015	Avon Engineering	Kyalami Hills Residential Development	Rehabilitation Plan
2017	Walt Landgoed	Besjeskuil Piggery	Rehabilitation Plan
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Riparian Audit and rehabilitation plan
2017	No2 Piggeries	Longside Piggery	Rehabilitation Plan
2017	Wegrow Farming Enterprises	Kleinfontein and Zoetfontein Proposed Piggery Infrastructure, Dam Upgrade and Pipeline	Rehabilitation Plan
2019	K2018010850 (South Africa)	Brits Crocodile River Prospecting Right Project	Rehabilitation and Closure Plan
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Watercourse Audit and Rehabilitation Plan
2018, 2020	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Rehabilitation Strategy Implementation Plan (RSIP)
2018	Enviroroots	Upgrading of the Rooipoort Dam	Rehabilitation Plan
2018	Enviroroots	Expansion of the P88 Road	Rehabilitation Plan
2017	No. 2 Piggeries	Longside Piggery Slurry Dams	Rehabilitation Plan
2018	REC Services	Kleinfontein and Zoetfontein Proposed Piggery Infrastructure, Dam Upgrade and Pipeline	Rehabilitation Plan
2017	Walt Landgoed	Biesjeskuil Piggery: Proposed Upgrade of River Crossings and Pipeline Construction	Rehabilitation Plan
2018	Onicalite	Clydesdale Colliery	Rehabilitation Plan
2018	No. 2 Piggeries	Ida Farms Piggery	Rehabilitation Plan
2018	Evilox 422 Boerdery	Roossenekal Piggery Slurry Dams	Rehabilitation Plan
2018	No. 2 Piggeries	Steenwyk Piggery Slurry Dam	Rehabilitation Plan
2018	Janlizmar	Vlaklaagte Piggery	Rehabilitation Plan

Rehabilitation

Year	Client	Project	Specialist study
2019	Catholic Archdiocese of Johannesburg Property	Marion Shrine	Rehabilitation Plan
2019	RussellStone Protein and Elangeni Oil	RussellStone Protein and Elangeni Oil	Rehabilitation Plan
2018	Sefateng Chrome Mine	Sefateng Chrome Mine	Watercourse Audit and Rehabilitation Plan
2021	K2018010724 (South Africa)	Rhenosterkop Prospecting Right	Rehabilitation and Closure Plan

Waste Classifications

Year	Client	Project	Specialist study
2018	Enviro Insight	Bloemendal Colliery	Waste Classification
2018	Vandaspark	Rondevly Colliery Mining Permit	Waste Classification
2018	REC Services	Welgedacht Colliery	Waste Classification
2019	Vandaspark	Rondevly Colliery Mining Right	Waste Classification
2020	Uitkomst Colliery	Wykom Siding	Waste Classification
2018	Enviro Insight	Bloemendal Colliery	Waste Classification
2018	Vandaspark	Rondevly Colliery Mining Permit	Waste Classification
2018	REC Services	Welgedacht Colliery	Waste Classification
2019	Vandaspark	Rondevly Colliery Mining Right	Waste Classification
2020	Uitkomst Colliery	Wykom Siding	Waste Classification
2020	Elemental Sustainability	Birmingham Mining Right	Waste Classification

Environmental Control Officer, Audits and Monitoring

Year	Client	Project	Specialist study
2014	Growth Point	Rivonia Crossing	WUL Audit
2017	Vus'ithemba Project Solutions	Vus'ithemba Piggery	Groundwater monitoring
2017	Vus'ithemba Project Solutions	Vus'ithemba Piggery	WUL Audit
2017	Vus'ithemba Project Solutions	Vus'ithemba Piggery	Environmental Authorisation Audit
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	EMP Performance Assessment
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Riparian Audit and rehabilitation plan
2017 to date	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Environmental Control Officer
2017 - 2018	NN Metals	Waltloo Scrap Facility	Environmental Control Officer
2017 to date	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Surface and Groundwater Monitoring
2019 to date	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Service and drinking water monitoring
2019 to date	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Dust fallout monitoring
2017, 2018, 2019, 2020, 2021	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	WUL Audit
2017, 2019	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	EMP Performance Assessment
2017	Bauba A Hlabirwa Mining Investments	Moeijelijk Mine	Watercourse Audit and Rehabilitation Plan
2018 - 2019	No. 2 Piggeries	Longside Piggery	Surface and Groundwater Monitoring
2018 - 2019	Prescali Environmental Consultants	Black Chrome Mine	Groundwater Monitoring
2017	Living Waters Properties	Ruah Eco Caravan Park	Watercourse Audit
2018	Sefateng Chrome Mine	Sefateng Chrome Mine	Watercourse Audit and Rehabilitation Plan
2018, 2019, 2020	Sefateng Chrome Mine	Sefateng Chrome Mine	WUL Audit
2018 - 2020	Sefateng Chrome Mine	Sefateng Chrome Mine	Environmental Control Officer
2020	Bokoni Platinum Mines	Bokoni Platinum Mines	Biodiversity Monitoring

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Nicole Upton

Registration Number: 121030

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)
Ecological Science (Professional Natural Scientist)

Effective **8 July 2020** Expires **31 March 2023**

Chairperson

Chief Executive Officer

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