BUFFELSPOORT SOLAR PV ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE, NORTH WEST PROVINCE

Environmental Impact Assessment Report

Reference: NWP/EIA/31/2022

November 2022

savannah environmental

t +27 (0)11 656 3237
f +27 (0)86 684 0547
e info@savannahsa.com
w www.savannahsa.com

Prepared for:

Buffelspoort Solar Project (Pty) Ltd
Wrigley Field The Campus
57 Sloane Street
Bryanston
Gauteng
2191

Prepared by:

savannah environmental

t +27 (0)11 656 3237 f +27 (0)86 684 0547 e info@savannahsa.com w www.savannahsa.com
First Floor, Block 2, 5 Woodlands Drive Office Park, Cnr Woodlands Drive & Western Service Road, Woodmead, 2191

PROJECT DETAILS

DEFF Reference	:	NWP/EIA/31/2022
Title	:	Environmental Impact Assessment Report for the Buffelspoort Solar PV Energy Facility and Associated Infrastructure, North West Province
Authors	:	Savannah Environmental (Pty) Ltd Candy Mahlangu Nkhensani Masondo Jo-Anne Thomas
Client	:	Buffelspoort Solar Project (Pty) Ltd
Report Status	:	Revision 0
Date	:	November 2022

When used as a reference this report should be cited as: Savannah Environmental (2022) Environmental Impact Assessment Report for the Buffelspoort Solar PV Energy Facility and Associated Infrastructure, North West Province.

PURPOSE OF THE EIA REPORT AND INVITATION TO COMMENT

Buffelspoort Solar Project (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Scoping and Environmental Impact Assessment Process for the Buffelspoort Solar Energy Facility with Associated Infrastructure. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998). This Environmental Impact Assessment report has been compiled in accordance with Appendix 3 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This EIA Report consists of ten chapters, which include:

- **Chapter 1** provides background to the Project and the EIA process.
- **Chapter 2** provides a description of the Project and alternatives considered for the project.
- **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
- **Chapter 4** describes the need for and site selection for the project.
- **Chapter 5** outlines the approach to undertaking the EIA process.
- **Chapter 6** describes the existing biophysical and social environment within and surrounding the study area and development area.
- **Chapter 7** provides an assessment of the direct, indirect and cumulative impacts associated with the proposed Project.
- **Chapter 8** presents the conclusions and recommendations for the Project.
- **Chapter 9** provides references used to compile the EIA Report.
- **Chapter 10** provides references used to compile the EIA report.

The EIA Report is available for review from **Friday, 04 November 2022** to **Monday, 05 December 2022** at (https://savannahsa.com/public-documents/energy-generation/). All comments received and recorded during the 30-day review and comment period have will be included, considered and addressed within the final EIA report for the consideration of the North West Department Economic Development, Environment, Conservation and Tourism (DEDECT).

Please submit your comments by **Monday, 05 December 2022** to:
Bregardia Rabbie PO Box 148, Sunninghill, 2157 Tel: 011-656-3237 Fax: 086-684-0547 Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

The Project Site[1], with an extent of ~223 ha has been identified by Buffelspoort Solar Project (Pty) Ltd as a technically feasible area for the development of the proposed Project. The Development Area[2] of ~77 ha has been identified within the Project Site by the Project Developer [3]for the development.

Infrastructure associated with the Project will include the following:

- Solar PV arrays comprising PV panels and mounting structures.
- Inverters and transformers.
- Cabling between the arrays.
- Onsite facility substation.
- 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.
- Battery Energy Storage System (BESS)[4] – to be initiated at a later stage than the Solar PV Energy Facility.
- Temporary laydown area.
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.
- Fencing around the site, including an access gate.

A grid connection corridor, which varies in width from 200 m to 300 m and is up to 2.5 km in length has been identified for assessment. The proposed grid connection infrastructure will be positioned within the confines of the assessed corridor. This corridor will allow for the consideration and avoidance of sensitive environmental features and technical constraints.
The potential environmental impacts associated with San Solar PV facility identified and assessed through the EIA process include:

- Impacts on ecology, flora and fauna.
- Impacts on avifauna.
- Impacts to soils and agricultural potential.
- Impacts on heritage resources, including archaeology and palaeontology.
- Visual impacts on the area imposed by the components of the facility.
- Social impacts.

[1] The Project Site is the aerial extent of the affected properties (~223ha) within which the Buffelspoort Solar PV Energy Facility is proposed.
[2] The Development Area is that identified area (located within the project site) which has been assessed by specialists within the Scoping Report with the aim of identifying areas of sensitivity which should be avoided by the Development Footprint and facility layout. The Development Area is ~77ha in extent and has been assessed in detail in this EIA Report.
[3] The Project Developer, Buffelspoort Solar Project (Pty) Ltd will be the party responsible for the construction and day-to-day operation and maintenance of the proposed Solar PV Energy Facility.
[4] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

Impacts on Ecology (including flora and fauna)

The Project Site is situated within the Savanna Biome. The savanna vegetation of South Africa represents the southern-most extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna Biome include a seasonal precipitation and a sub-tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

The Savanna Biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over topped by a discontinuous, but distinct woody plant layer (Mucina & Rutherford, 2006). At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (*microphyllous*) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by *microphyllous* woody plants of the Mimosaceae family (Common genera include *Vachellia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

The present land use had a direct impact on both the fauna and the flora in the area, which is evident in the disturbed and transformed habitats. Historically, land clearing and the subsequent mismanagement has led to the deterioration of most of the area to a disturbed habitat that has not recovered since. However, the degraded Bushveld habitat in the wider project area can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by development.

The degraded Bushveld habitat in the Project Site has a High ecological theme sensitivity.

The habitat sensitivity of the degraded Bushveld and wetland/water resources is regarded as high and medium respectively, due to the species recorded and the role of this intact unique habitat to biodiversity within a very fragmented local landscape, not to mention the sensitivity according to various ecological datasets.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas provide a variety of ecological services considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is the most important aspect to consider for the proposed Project.

Development in high sensitivity areas must be avoided, which will occur with the selection of the Project Site. Development within the high sensitivity areas within the Project Site will lead the direct destruction and loss of functional habitats; and the faunal species that are expected to utilise this habitat. Thus, if these areas are not maintained in a natural or near natural state, destroyed or fragmented, then meeting targets for biodiversity features will not be achieved. The mitigation measures, management and associated monitoring regarding the expected impacts will be the most important factor of this Project.

Mitigation measures as described in the Terrestrial Biodiversity Assessment (refer to **Appendix D**) can be implemented to reduce the significance of the risk. Considering that this area that has been identified as being of significance for biodiversity maintenance and ecological processes, development may proceed but with caution and only with the implementation of mitigation measures.

Considering the above-mentioned information, no fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

Impacts on Aquatic Ecology

Based on the results and conclusions presented in Wetland Baseline and Risk Assessment (**Appendix E**) it is expected that the proposed activities will have low residual impacts on the wetlands and thus no fatal flaws were identified for the Project.

Impacts on Avifauna

According to the Avifauna Impact Assessment (**Appendix F**) the proposed Project will have a high or medium impact on the avifauna which, in most instances, could be reduced to a lower impact through appropriate mitigation. Based on the current types of bird species recorded in the Development Footprint the proposed Project will not have a high residual impact should all the mitigations and recommendations be implemented.

No fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

Impacts on Soil and Agricultural Potential

The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the Project Site, which predominantly covers "Moderately Low" to "Moderate" sensitivities. Smaller patches are characterised by sensitivities up to "Moderately High". Furthermore, various crop field boundaries were identified by means of the DEFF Screening Tool (2022), which indicated that the grid connection corridor is predominantly characterised by "High" sensitivity crop fields. It is mainly recommended that high sensitivity crop field be avoided. However, in the event that relocating of the Project Site is not feasible, stakeholders should undertake an evaluation of possible agreement with the landowners prior to any development in those areas.

The Project Site is associated with both arable and non-arable soils. However, the available climatic conditions of low annual rainfall and high evapotranspiration potential severely limits crop production significantly resulting in land capabilities with "Low" and "Moderate high" sensitivities. The land capabilities associated with the Project Site are suitable for cropping and grazing, which corresponds with the current land use.

The final results indicate "Low" post-mitigation significance ratings for the proposed Project. It is therefore clear that the proposed Project is expected to have a low impact on land potential resources. It is the specialist's opinion that the proposed Project will have no impacts on the agricultural production ability of the land and therefore may be favourably considered.

Impacts on Heritage Resources (archaeological and paleontological)

Heritage resources are present within the Development Footprint of the Buffelspoort Solar PV Energy Facility. The initial projected impact is rated as LOW to HIGH on these heritage resources before mitigation measures. Through the combination of the various environmental, cultural, and socio-economic sensitivities, the client

can develop a layout option that will reduce the impact on the heritage resources. The proposed layout reduces the impact on the heritage resource identified to LOW.

According to the PalaeoMap of SAHRIS, the Palaeontological Sensitivity of the proposed Development Footprint is zero or insignificant.

From a heritage and paleontological perspective, both the facility and grid connection are considered acceptable.

Visual Impacts

The findings of the Visual Impact Assessment undertaken for the proposed Buffelspoort PV Solar facility and its associated infrastructure is that the visual environment surrounding the site, especially within a 1km radius (and potentially up to a radius of 3km) of the proposed facility, may be visually impacted during the anticipated operational lifespan of the facility (i.e. a minimum of 15 years). The anticipated visual impacts listed in the Visual Impact Assessment (refer to **Appendix I**) range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed Solar PV Energy Facility are not considered to be fatal flaws for the proposed Project. Considering all factors, it is recommended that the development of the Solar PV Energy Facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management programme.

Social Impacts

The proposed Project will create a number of potential socio-economic opportunities and benefits and is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the Project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the Project as detailed in **Appendix J**.

Assessment of Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of several renewable energy facilities in South Africa. The degree of significance of these cumulative impacts is difficult to predict without detailed studies based on more comprehensive data/information on each of the receptors and the site-specific developments. The alignment of renewable energy developments with South Africa's National Energy Response Plan and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The economic benefits of renewable energy developments at a local, regional and national level have the potential to be significant.

All cumulative impacts associated with the Project are expected to be of a medium or low significance, with impacts of a high significance associated with the visual impacts.

Based on the specialist cumulative assessment and findings, the development of the Project and its contribution to the overall impact of all renewable energy projects to be developed within a 30km radius, it can be concluded that the contribution of the project to cumulative impacts will be of a medium to low significance, with impacts of a high significance mainly relating to visual impacts on the landscape.

Therefore, it was concluded that the development of the Project will not result in unacceptable, high cumulative impacts and will not result in a whole-scale change of the environment.

Overall Conclusion & Recommendations

Considering the findings of the independent specialist studies, the impacts identified, the development footprint proposed by the developer within the development site, the avoidance of the sensitive environmental features within the project site, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that the Buffelspoort Solar Energy Facility and Associated Infrastructure is acceptable within the landscape and can reasonably be authorised. The proposed layout as provided by the Applicant (**Figure 1**) is considered to be the most appropriate from an environmental perspective as it avoids identified sensitivities and recommended buffer areas.

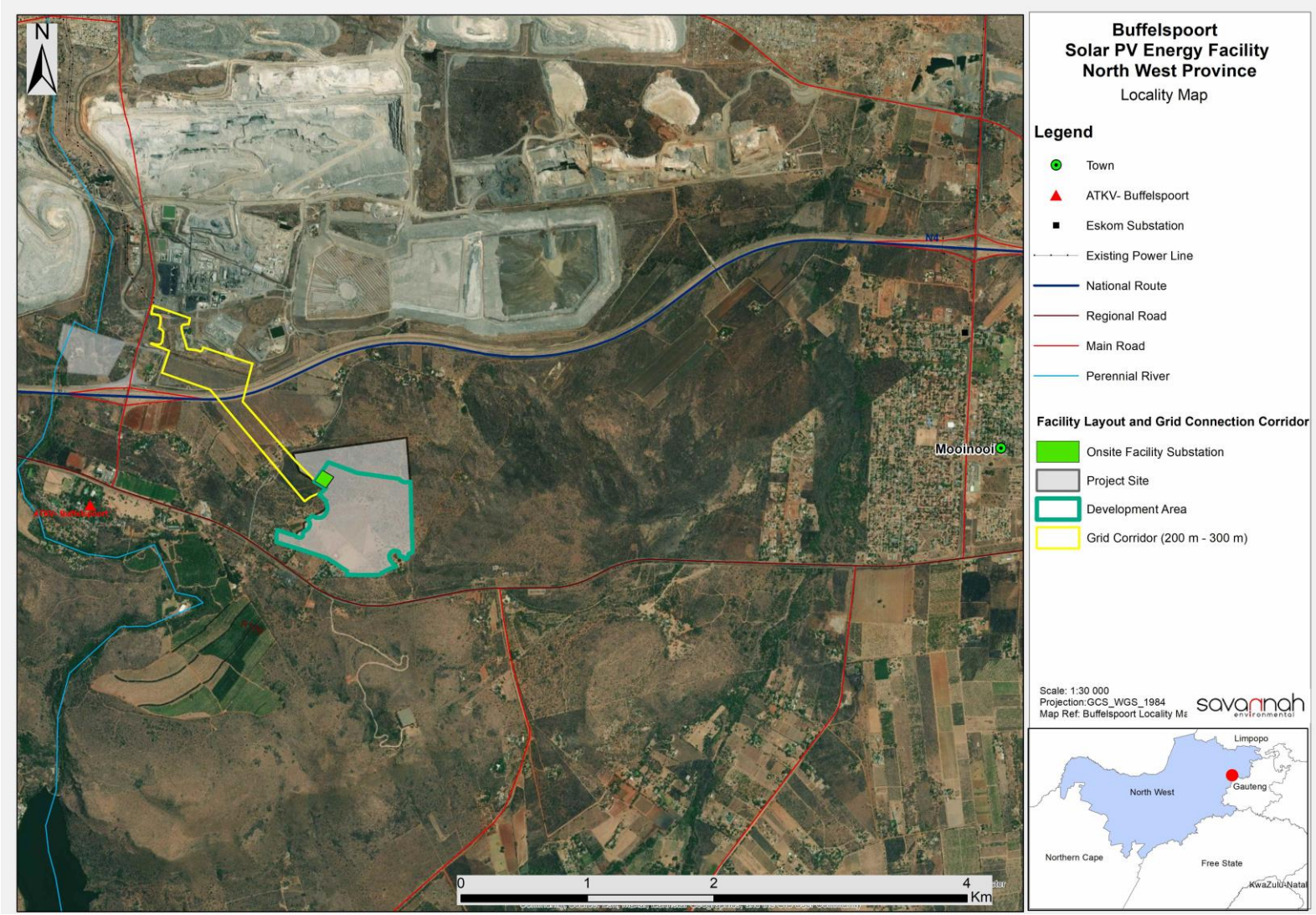

Figure 1.: Locality map illustrating the location of the Buffelspoort Solar PV Energy Facility development area and the grid connection corridor (refer to **Appendix O** for map).

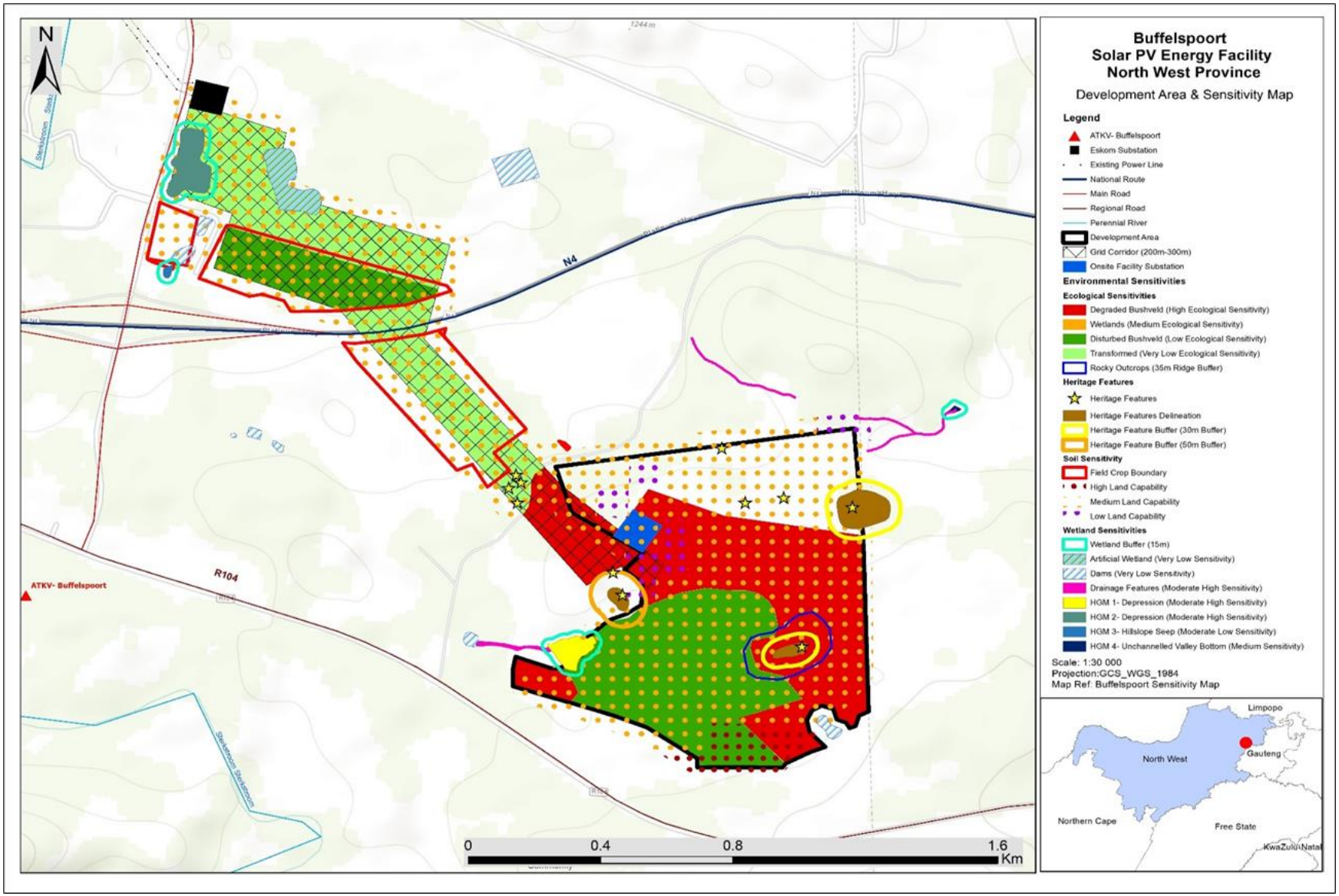

Figure 2: Layout and sensitivity map of the preferred development footprint and grid connection corridor for the San Solar PV Facility, as was assessed as part of the EIA process (**A3 map is included in Appendix O**)

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Commercial Operation date: The date after which all testing and commissioning has been completed and is the initiation date to which the seller can start producing electricity for sale (i.e. when the project has been substantially completed).

Commissioning: Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the wind turbine are installed.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Development area: The development area is that identified area (located within the project site) which has been assessed by specialists within this Scoping Report with the aim of identifying areas of sensitivity which should be avoided by the development footprint or facility layout. The development area is ~77ha in extent.

Development footprint: The development footprint is the defined area (located within the development area) where the Solar PV Energy Facility and other associated infrastructure for the Project is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

Disturbing noise: A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Endemic: An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts

include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Method statement: A written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

Mitigation hierarchy: The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pre-construction: The period prior to the commencement of construction, this may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Project developer: The project developer, Buffelspoort Solar Project (Pty) Ltd will be the party responsible for the construction and day-to-day operation and maintenance of the proposed Solar PV Energy Facility.

Project site: The project site is the aerial extent of the affected properties (~223ha) within which the Buffelspoort Solar PV Energy Facility is proposed.

Proponent: Applicant/Project Developer, Buffelspoort Solar Project (Pty) Ltd will be the party responsible for the construction and day-to-day operation and maintenance of the proposed Solar PV Energy Facility.

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Rotor: The portion of the wind turbine that collects energy from the wind is called the rotor. The rotor converts the energy in the wind into rotational energy to turn the generator. The rotor has three blades that rotate at a constant speed of about 15 to 28 revolutions per minute (rpm).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries, and the Environment (National)
DWS	Department of Water and Sanitation
CBA	Critical Biodiversity Area
CR	Critically Endangered
CSIR	Council for Scientific and Industrial Research
DM	District Municipality
DMRE	Department of Mineral Resources Energy
EAP	Environmental Assessment Practitioner
EGIS	Environmental Geographic Information System
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EN	Endangered
EP	Equator Principles
ESA	Ecological Support Area
GA	General Authorisation
GHG	Greenhouse Gas
HGM	Hydrogeomorphic
IBA	Important Bird Area
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
I&AP	Interested and Affected Party
km	Kilometre
kWh	Kilowatt hour
LC	Least Concern
LM	Local Municipality
m	Metre
m^2	Square meters
m^3	Cubic meters
m amsl	Metres Above Mean Sea Level
MW	Megawatts
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (No. 59 of 2008)
NFA	National Forests Act (No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area

NHRA	National Heritage Resources Act (No. 25 of 1999)
NT	Near Threatened
NWA	National Water Act (No. 36 of 1998)
NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
ONA	Other Natural Area
PA	Protected Area
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAIAB	South African Institute for Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
TOPS	Threatened or Protected Species
VU	Vulnerable

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CHAPTER 1: INTRODUCTION

The Applicant, Buffelspoort Solar Project (Pty) Ltd is proposing to develop, construct and operate a Solar Photovoltaic (PV) Energy Facility and associated infrastructure (hereafter referred to as the "Project") on a site, located approximately 6km west of Mooinooi, within the jurisdiction of the Rustenburg Local Municipality and the Bojanala Platinum District Municipality in the North West Province on the following affected properties (i.e., the Project Site) (refer to **Figure 1.1**):

Solar PV Energy Facility:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 134 of Farm Buffelspoort 343JQ

Grid Connection Corridor:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 88 of Farm Buffelspoort 343JQ
» Portion 89 of Farm Buffelspoort 343JQ
» Portion 101 of Farm Buffelspoort 343JQ
» Portion 119 of Farm Buffelspoort 343JQ
» Portion 120 of Farm Buffelspoort 343JQ
» Portion 121 of Farm Buffelspoort 343JQ
» Portion 122 of Farm Buffelspoort 343JQ
» RE of Portion 101 of Farm Kafferskraal 342JQ
» RE of Portion 148 of Farm Kafferskraal 342JQ
» Portion 236 of Farm Kafferskraal 342JQ
» Portion 303 of Farm Kafferskraal 342JQ
» Portion 374 of Farm Kafferskraal 342JQ
» Portion 376 of Farm Kafferskraal 342JQ

The Project will have a contracted capacity of up to 40 MWp and will be known as the Buffelspoort Solar PV Energy Facility. The purpose of the Project will be to supply power to a private off-taker via a newly proposed 88kV single circuit overhead power line. The overhead power line will be approximately 2.5 km in length and will be routed across several privately-owned properties from the onsite Project substation to the point of interconnection, north of the N4 Bakwena Highway. The development of the Project is aimed at diversifying the energy mix for the private off-taker and to reduce their reliance on Eskom supplied power. It is also a conscious effort for the off-taker to contribute to their sustainability targets and reduce their carbon footprint.

From a regional perspective, the North West Province, and particularly the area under investigation, is considered favourable for the development of a commercial Solar PV Energy Facility by virtue of prevailing climatic conditions, topography, the extent of the affected properties, the availability of a grid connection point and the availability of land on which the development can take place.

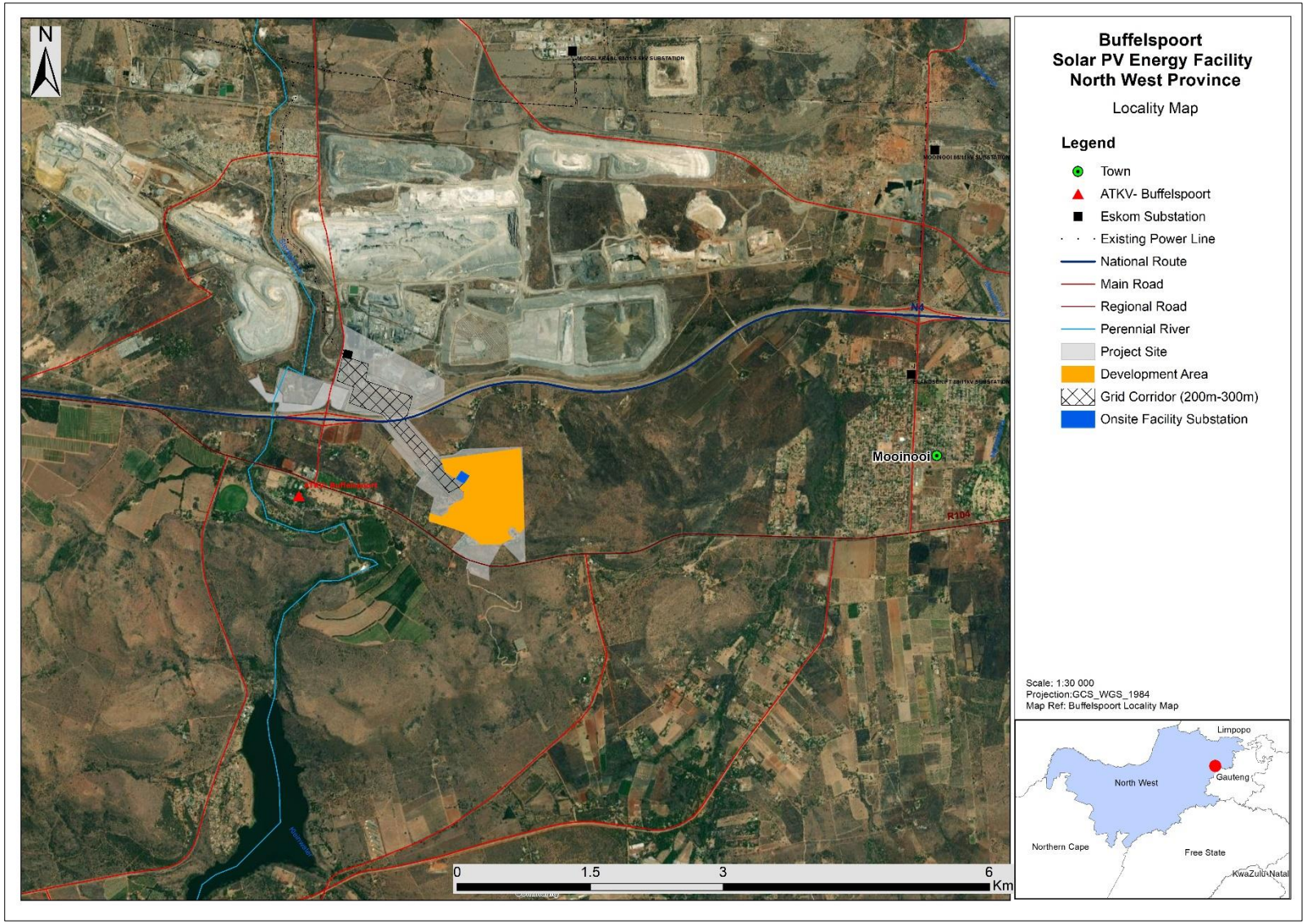


Figure 1.1: Locality map illustrating the location of the Buffelspoort Solar PV Energy Facility development area and grid connection corridor (also refer to **Appendix O** for maps).

1.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of a Scoping Report

This EIA Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (and amended on 07 April 2017) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This chapter of the EIA Report includes the following information required in terms of Appendix 3: Scope of Assessment and Content of Environmental Impact Assessment Report:

Requirement	Relevant Section
2(1)(a)(i) the details of the EAP who prepared the report and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	The details of the EAP and the expertise of the EAP have been included in **Section 1.5**. The Curriculum vitae of the Savannah Environmental team have been included as **Appendix A**.
2(1)(b) the location of the activity, including (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	Details of the location of the Project, the affected properties, including the property names and numbers, as well as the SG-codes are included in **Table 1.1**.
2(1)(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A locality map illustrating the location of the Project has been included in **Figure 1.1**. The centre point co-ordinates of the project site are included in **Table 1.1**.

This EIA Report consists of nine chapters, which include:

- **Chapter 1** provides background to the Project and the EIA process.
- **Chapter 2** provides a description of the Project and alternatives considered for the project.
- **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
- **Chapter 4** describes the need for and site selection for the project.
- **Chapter 5** outlines the approach to undertaking the EIA process.
- **Chapter 6** describes the existing biophysical and social environment within and surrounding the study area and development area.
- **Chapter 7** provides an assessment of the direct, indirect and cumulative impacts associated with the proposed Project.
- **Chapter 8** presents the conclusions and recommendations for the Project.
- **Chapter 9** provides references used to compile the EIA Report.
- **Chapter 10** provides references used to compile the EIA report.

1.2 Project Overview

The Project Site[5], with an extent of ~223 ha has been identified by Buffelspoort Solar Project (Pty) Ltd as a technically feasible area for the development of the proposed Project. The Development Area[6] of ~77 ha has been identified within the Project Site by the Project Developer [7]for the development.

Infrastructure associated with the Project will include the following:

- Solar PV arrays comprising PV panels and mounting structures.
- Inverters and transformers.
- Cabling between the arrays.
- Onsite facility substation.
- 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.
- Battery Energy Storage System (BESS)[8] – to be initiated at a later stage than the Solar PV Energy Facility.
- Temporary laydown area.
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.
- Fencing around the site, including an access gate.

A grid connection corridor, which varies in width from 200 m to 300 m and is up to 2.5 km in length has been identified for assessment. The proposed grid connection infrastructure will be positioned within the confines of the assessed corridor. This corridor will allow for the consideration and avoidance of sensitive environmental features and technical constraints.

Table 1.1: Detailed description of the project site.

Province	**North West Province**
District Municipality	Bojanala Platinum District Municipality
Local Municipality	Rustenburg Local Municipality
Ward Number (s)	Ward 32
Nearest town(s)	Mooinooi (~6km east of the project site)
Farm name(s) and number(s) of properties affected by the Project	Solar PV Energy Facility: » Portion 75 of Farm Buffelspoort 343JQ » Portion 134 of Farm Buffelspoort 343JQ Grid Connection Corridor:

[5] The Project Site is the aerial extent of the affected properties (~223ha) within which the Buffelspoort Solar PV Energy Facility is proposed.
[6] The Development Area is that identified area (located within the project site) which has been assessed by specialists within the Scoping Report with the aim of identifying areas of sensitivity which should be avoided by the Development Footprint and facility layout. The Development Area is ~77ha in extent and has been assessed in detail in this EIA Report.
[7] The Project Developer, Buffelspoort Solar Project (Pty) Ltd will be the party responsible for the construction and day-to-day operation and maintenance of the proposed Solar PV Energy Facility.
[8] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

	» Portion 75 of Farm Buffelspoort 343JQ » Portion 88 of Farm Buffelspoort 343JQ » Portion 89 of Farm Buffelspoort 343JQ » Portion 101 of Farm Buffelspoort 343JQ » Portion 119 of Farm Buffelspoort 343JQ » Portion 120 of Farm Buffelspoort 343JQ » Portion 121 of Farm Buffelspoort 343JQ » Portion 122 of Farm Buffelspoort 343JQ » RE of Portion 101 of Farm Kafferskraal 342JQ » RE of Portion 148 of Farm Kafferskraal 342JQ » Portion 236 of Farm Kafferskraal 342JQ » Portion 303 of Farm Kafferskraal 342JQ » Portion 374 of Farm Kafferskraal 342JQ » Portion 376 of Farm Kafferskraal 342JQ
SG 21 Digit Code (s)	» Portion 75 of Farm Buffelspoort 343JQ: T0JQ00000000034300075 » Portion 88 of Farm Buffelspoort 343JQ: T0JQ00000000034300088 » Portion 89 of Farm Buffelspoort 343JQ: T0JQ00000000034300089 » Portion 101 of Farm Buffelspoort 343JQ: T0JQ00000000034300101 » Portion 119 of Farm Buffelspoort 343JQ: T0JQ00000000034300119 » Portion 120 of Farm Buffelspoort 343JQ: T0JQ00000000034300120 » Portion 121 of Farm Buffelspoort 343JQ: T0JQ00000000034200121 » Portion 122 of Farm Buffelspoort 343JQ: T0JQ00000000034200122 » RE Portion 101 of Farm Kafferskraal 342JQ: T0JQ00000000034200101 » RE Portion 148 of Farm Kafferskraal 342JQ: T0JQ00000000034200148 Portion 236 of Farm Kafferskraal 342JQ: T0JQ00000000034200236 » Portion 303 of Farm Kafferskraal 342JQ: T0JQ00000000034200303 » Portion 374 of Farm Kafferskraal 342JQ: T0JQ00000000034200374 » Portion 376 of Farm Kafferskraal 342JQ: T0JQ00000000034200376
Current Zoning	Agricultural (currently being used as a leisure Game farm by the landowner)
Site Coordinates (centre of project site)	25°45'17.15"S 27°30'7.90"E

The key infrastructure components proposed as part of the Project are described in greater detail in Chapter 2 of this EIA Report.

The overarching objective for the Project is to maximise electricity production through exposure to the available solar resource, while minimising infrastructure, operational and maintenance costs, as well as potential social and environmental impacts in accordance with the principles of sustainable development.

The full extent of the development area and the grid connection corridor (200-300 m wide and ~2.5 km long) were considered within the Scoping Process with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning. Within this identified Development Area, a Development Footprint[9] has been defined for assessment in the EIA Phase

[9] The Development Footprint is the defined area (located within the Development Area) where the Solar PV Energy Facility and other associated infrastructure for the Project is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

taking into consideration the environmental sensitivities or constraints identified through the scoping evaluation.

1.3 Overview of the Environmental Impact Assessment (EIA) Process

Section 24 of South Africa's National Environmental Management Act (No. 107 of 1998) (NEMA) pertains to Environmental Authorisations (EA), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the Competent Authority (CA). The 2014 Environmental Impact Assessment (EIA) Regulations, as amended (GNR 326) published under NEMA prescribed the process to be followed when applying for Environmental Authorisation (EA), while the Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324)) contain those activities which may not commence without Environmental Authorisation from the Competent Authority.

Various aspects of the Project are listed as activities that may have a detrimental impact on the environment. The primary listed activity triggered by the Project is Activity 1 of Listing Notice 2 (GN R325) which relates to the development of facilities or infrastructure for the generation of electricity from a renewable resource where the generating capacity is 20 MW or more. The Project will have a contracted capacity of up 40 MWp. The application for authorisation for the project is therefore required to be supported by a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326).

According to the Explanatory Document for Government Notice No. 779 published in Government Gazette No. 40110 dated 01 July 2016, if the proponent will not, or does not, intend to participate in any of the Integrated Resource Plan programmes (IRP), the Competent Authority will be the Member of the Executive Council (MEC) responsible for environmental affairs in the respective province, unless another sub-section of section 24C of NEMA specifies the Minister to be the CA. Since the purpose of the Project is to generate power for exclusive use by a private off-taker, and since the Project will not be bid into the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or a similar government programme, the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT) has been designated as the CA in this instance.

An EIA is an effective planning and decision-making tool for the Project Developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the Project Developer to be forewarned of potential environmental issues and allows for the resolution of the issues reported on in the Scoping and EIA reports as well as dialogue with interested and affected parties (I&APs).

The EIA process comprises of two (2) phases (i.e., Scoping and Impact Assessment) and involves the identification and assessment of potential environmental impacts through the undertaking of independent specialist studies, as well as public participation. The processes followed in these two phases are as follows:

» The **Scoping Phase** includes the identification of potential issues associated with the Project through a desktop study (considering existing information), limited field work, and consultation with interested and affected parties and key stakeholders. This phase considers the Development Area in order to identify and delineate any environmental fatal flaws, no-go and / or sensitive areas. Following a public review

period of the Scoping Report, this phase culminates in the submission of a final Scoping Report and Plan of Study for the EIA to the CA for consideration and acceptance.

» The **EIA Phase** involves a detailed assessment of the potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considers a proposed Development Footprint within the Development Area and includes detailed specialist investigations as well as public consultation. Following a public review period of the EIA Report, this phase culminates in the submission of a final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to the CA for final review and decision-making.

1.4 Details of Environmental Assessment Practitioner and Expertise to conduct the S&EIA Process

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), the Project Developer has appointed Savannah Environmental (Pty) Ltd as the independent environmental consultant responsible for managing the Application for EA and supporting Scoping and Environmental Impact Assessment (S&EIA) process; inclusive of comprehensive, independent specialist studies. The application for EA and S&EIA process will be managed in accordance with the requirements of NEMA, the 2014 EIA Regulations (GNR 326), and all other relevant applicable legislation.

Neither Savannah Environmental nor any of its specialists are subsidiaries or are affiliated to the Project Developer. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed facility.

Savannah Environmental is a specialist environmental consulting company providing a holistic environmental management service, including environmental assessment, and planning to ensure compliance and evaluate the risk of development, and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team. The Savannah Environmental team for this project includes (refer to **Appendix A**):

» **Candy Mahlangu,** holds a Bachelor of Arts degree in Environmental Management and is experienced in executing professionally consulting services for various projects in the environmental management field. She specialises in conducting Environmental Impacts Assessments, public participation processes, compiling Environmental Management Programmes, for residential developments, commercial developments, industrial upgrades, bulk services, and renewable energy projects. Her main responsibilities include conducting public participation, overall compilation of the Basic Assessments and EIA report, specialists' engagements, reviewing specialists reports and incorporating specialist studies into the Environmental Impact Assessment reports and the associated Environmental Management Programmes. She has also been widely exposed to the associated project management in her trade and developed skills such as stakeholder engagement which includes but not limited to, site inspections, planning and liaising with clients, environmental specialists, built environment consultants, statutory bodies and competent authorities.

» **Nkhensani Masondo**, the principle author of this report and EAP on this project is registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA (2020/1385) and holds a BSocSci in Environmental Analysis and Management and is currently completing her MSc in

Environmental Management. She has six (6) years of working experience in the environmental field and has gained extensive experience in conducting Environmental Impact Assessments, Stakeholder Engagements, Environmental Auditing and Environmental Management Plans Programmes for a wide range of projects. She is responsible for overall compilation of the report, this includes reviewing specialists reports and incorporating specialist studies into the Basic Assessment report and its associated Environmental Management.

» **Jo-Anne Thomas** is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA - 2019/726) and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). She provides technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Her key focus is on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures.

» **Bregardia Rabbie** is a Public Participation Consultant at Savannah Environmental. She has 6 years working experience in project management and coordinating public participation processes in the Telecommunication industry. She has good communication skills and utilizes this skill to manage interaction between National, Provincial, and local authorities and the community. Bregardia is skilled at organising, managing, and coordinating public participation and engagement projects effectively and timeously.

1.5 Details of the Independent Specialist Team

In order to adequately assess potential impacts associated with the Project, a number of specialists have been appointed as part of the project team and have provided specialist input into this EIA Report (refer Table 1.2). CVs detailing the independent specialists' expertise and relevant experience are provided in **Appendix H**.

Table 1.2 Independent Specialists that contributed to the EIA Report

Specialist	Area of Expertise
Jan Jacobs, Rian Pienaar and Andrew Husted of The Biodiversity Company	Terrestrial Ecology (including flora, fauna and avifauna), Freshwater and soils
Nondumiso Bulunga and Molatela Ledwaba of Savannah Environmental (Pty) Ltd and peer reviewed by Tony Barbour of Tony Barbour Environmental Consulting	Social
Lourens du Plessis of LoGIS	Visual
Wouter Fourie and Michelle Sachse of PGS Heritage	Heritage including archaeology and palaeontology)

CHAPTER 2: PROJECT DESCRIPTION

This Chapter provides an overview of the Project and details the project scope which includes the planning/design, construction, operation, and decommissioning activities required for the development. It must be noted that the project description presented in this Chapter may change to some extent based on the outcomes and recommendations of detailed engineering and other technical studies, the findings and recommendations of the S&EIA and supporting specialist studies, and any licencing, permitting, and legislative requirements.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Environmental Impact Assessment Report

This chapter of the EIA Report includes the following information required in terms of Appendix 3: Scope of Assessment and Content of the Environmental Impact Assessment Report:

Requirement	Relevant Section
3(1)(d) a description of the scope of the proposed activity, including: (i) All listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure	A description of the project and all associated infrastructure is included in **Section 2.4**. Activities to be undertaken during the various project development phases is included in **Section 2.6**.
3(1)(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.	The motivation for the site selection of the Buffelspoort Solar PV Energy Facility is included and discussed in **Section 2.3.** and **Table 2.4.**
3(1)(h)(i) details of the development footprint alternatives considered	The details of the alternatives considered as part of Buffelspoort Solar PV Energy Facility facility and as part of the Scoping & EIA Process have been included in **Section 2.3**
3(1)(h)(ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such.	The details of the alternatives considered as part of Buffelspoort Solar PV Energy Facility and as part of the Scoping & EIA Phase have been included in **Section 2.4.** Where no alternatives are being considered a motivation has been included.
3(1)(h)(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	The details of the alternatives considered as part of Buffelspoort Solar PV Energy Facility and as part of the Scoping & EIA Phase have been included in **Section 2.4.** Where no alternatives are being considered a motivation has been included.

2.1. Nature and Extent of the Buffelspoort Solar PV Energy Facility

Buffelspoort Solar Project (Pty) Ltd is proposing to develop, construct and operate a Solar PV Energy Facility and associated infrastructure to generate electricity for use by a private off-taker. The development of the Solar PV Energy Facility is aimed at diversifying the energy mix for the private off-taker and to reduce their reliance on Eskom supplied power. It is also a conscious effort for the off-taker to contribute to their

sustainability targets and reduce their carbon footprint. The Project will be developed in a single phase (with the exception of the BESS which will be phased in at a later stage) and will have a contracted capacity of up to 40 MWp. The Project will make use of fixed-tilt or single-axis tracking PV technology and bifacial panels.

The Project will comprise solar panels which, once installed, will stand up to 3 m above ground level. The solar panels will include string inverters mounted above ground.

2.1.1. Project Overview

The Project is to be developed on a site located approximately 6 km west of Mooinooi. The Development Area and grid connection corridor fall within the Rustenburg Local Municipality of the Bojanala Platinum District Municipality in the North West Province. The full extent of the Development Area (~77ha) and the Grid Connection Corridor (200-300m wide and ~2.5km long) have been considered within the EIA process, within which the d=Development Footprint will be appropriately located from a technical and environmental sensitivity perspective. The Development Area and Grid Connection Corridor are proposed on the following affected properties:

Solar PV Energy Facility:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 134 of Farm Buffelspoort 343JQ

Grid Connection Corridor:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 88 of Farm Buffelspoort 343JQ
» Portion 89 of Farm Buffelspoort 343JQ
» Portion 101 of Farm Buffelspoort 343JQ
» Portion 119 of Farm Buffelspoort 343JQ
» Portion 120 of Farm Buffelspoort 343JQ
» Portion 121 of Farm Buffelspoort 343JQ
» Portion 122 of Farm Buffelspoort 343JQ
» RE of Portion 101 of Farm Kafferskraal 342JQ
» Portion 374 of Farm Kafferskraal 342JQ
» Portion 376 of Farm Kafferskraal 342JQ
» Portion 236 of Farm Kafferskraal 342JQ
» Portion 303 of Farm Kafferskraal 342JQ
» RE of Portion 148 of Farm Kafferskraal 342JQ

The Project Site (i.e., the affected properties) within which the Project is proposed is situated north of the R104 Old Rustenburg provincial road, which will provide the primary access point to the Project Site, south of the N4 Bakwena National Highway and west of Marikana Road (refer to **Figure 2.1**).

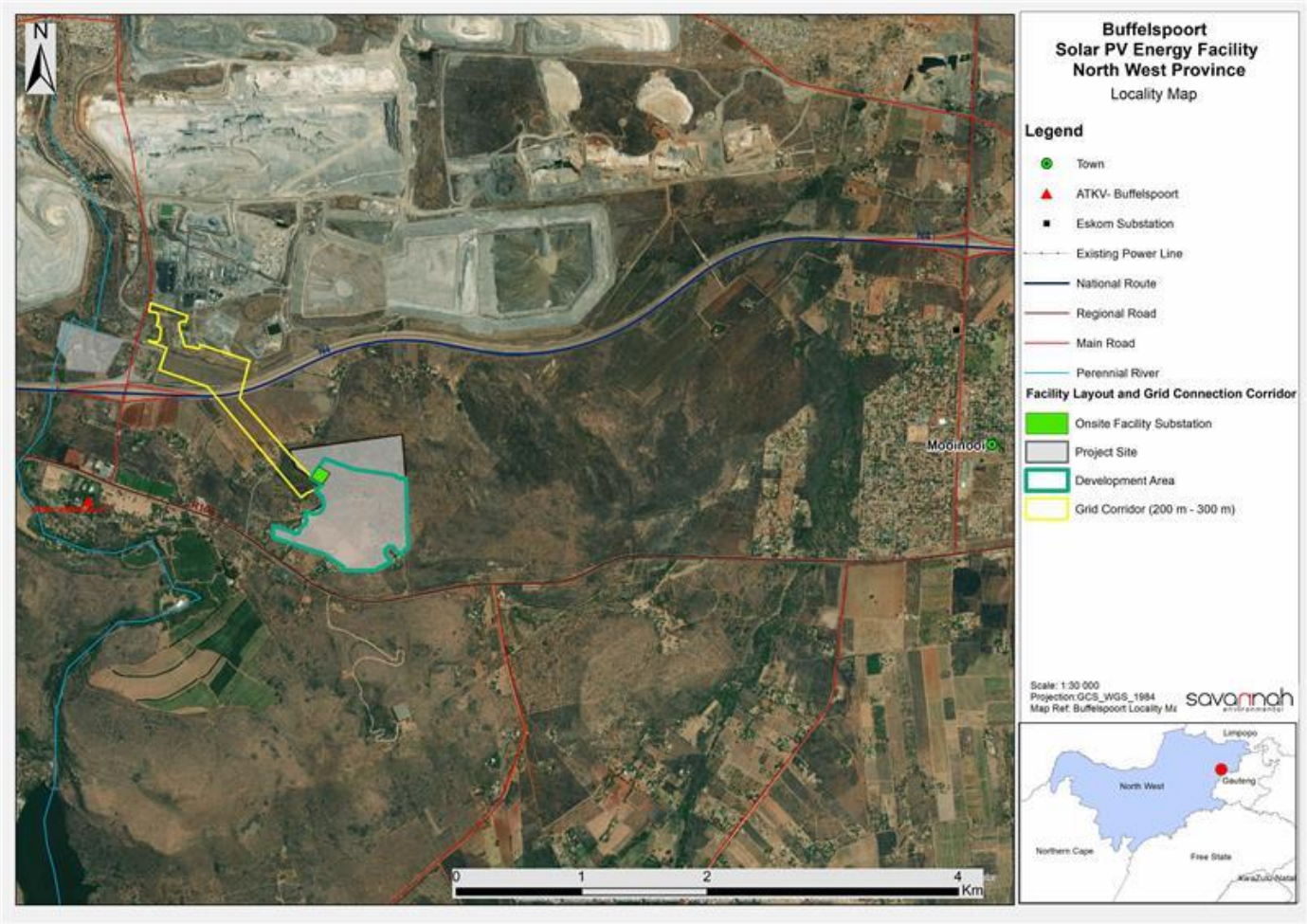


Figure 2.1: Location of the R104, N4 and Marikana Road in relation to the Project.

2.1.2. Components of the Buffelspoort Solar PV Energy Facility

Infrastructure associated with the Solar PV Energy Facility will include:

- Solar PV arrays comprising PV panels and mounting structures.
- Inverters and transformers.
- Cabling between the arrays.
- Onsite facility substation.
- 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.
- Battery Energy Storage System (BESS)[10] – to be initiated at a later stage than the Solar PV Energy Facility.
- Temporary laydown area.
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.

[10] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the off-taker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the off-taker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

» Fencing around the site, including an access gate.

A summary of the details and dimensions of the planned infrastructure associated with the Project is provided in **Table 2.1**

Table 0.1: Details or infrastructures proposed as part of the Project. Specific details to be confirmed in the EIA phase.

Infrastructure	Footprint and dimensions
Number of Modules	Up to 75 000 modules (560Wp modules for the generation of up to 40 MWp)
Contracted Capacity	Up to 40 MWp
Area occupied by the solar array	up to 20 ha
Panel Height	Up to 3 m
Technology	The Project will make use of fixed-tilt or single-axis tracking PV technology and bifacial panels
Inverters	» Up to 116 inverters » Height: 660 mm
BESS	» Proposed technology: Lithium - Ion or Lithium-iron-phosphate or Redox Vanadium battery technology » Footprint: up to 2 ha » Height: Up to 3 m » Proposed capacity of battery storage: 30MW / 4 hours of usable energy at Beginning of Life
Other infrastructures	» Fencing: 3m high around 4 000m » O&M building (including site security office, warehouse, storage area and workshop): 500m^2, 3m high
Area occupied by temporary laydown area	2 x 2 500m^2
Area occupied by the onsite facility substation	1 ha
Capacity of onsite facility substation	88kV
Access and internal roads associated with the facility	An existing access road, which may be upgraded with hard surface, will be used to access the facility (up to 6m wide). Newly proposed internal gravel roads will be established between the arrays (3.5 m wide) and around the boundary of the site (2.5 m wide).
Grid connection	A grid connection corridor, which is up to 200-30 0m wide and 2.5 km long to allow for avoidance of environmental sensitivities and technical constraints, and suitable placement of the overhead power line within the corridor has been assessed as part of the S&EIA process. The dimensions of newly proposed overhead power line are provided below: » Capacity and circuit of the power line: 88kV (single circuit) » Power line servitude width: 32m » Height of the power line towers (pylons):16-24m During construction, a permanent access road along the length of the power line corridor between 4 – 8m wide will be established to allow for large crane movement. This track will then be utilised for maintenance during operation.

Infrastructure	Footprint and dimensions
Temporary infrastructure	Temporary infrastructure, including laydown areas, hardstand areas and a concrete batching plant, will be required during the construction phase. All areas affected by temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operational phase.

Table 2.2 provides details regarding the requirements and the activities to be undertaken during the Project development phases (i.e., construction phase, operation phase and decommissioning phase). **Section 2.3** provides details of the technology considered for the Project.

2.1.3. Project Development Phases Associated with the Buffelspoort Solar PV Energy Facility

Table 2.2: Details of the Project development phases (i.e., construction, operation, and decommissioning).

Construction Phase	
Requirements	» Project receives Environmental Authorisation from NW DEDECT. » Construction period expected to be up to 12 months. » Create direct construction employment opportunities. The number of employment opportunities to be created during the construction phase will be derived as the Project modelling progresses during the EIA Phase but is estimated at approximately 200 jobs for the construction phase. » No on-site labour camps are planned to be established during the construction phase. Workers will be sourced from the neighbouring towns and will be transported to site daily. » Overnight on-site worker presence would be limited to security staff. » Waste removal and sanitation will be undertaken by a suitably qualified sub-contractor. Waste containers, including containers for hazardous waste, will be located at easily accessible locations on site when construction activities are undertaken. » Electricity required for construction activities will be sourced from the off-taker. The off-taker is in the process of upgrading the Eskom power supply to the Quarantine facility where a construction power point will be made available. The upgrade to the electricity supply is expected to be completed by end March 2023.Water required for the construction phase will be sourced from the onsite boreholes (x3) and stored in storage tanks. Should the required WUL not be obtained in time the project will source water from the WSA - RLM and trucked to site until the WUL is approved. » Sewage due to the presence of personnel on-site will be produced during the construction phase. Mobile chemical toilets will be used, and these will be emptied and maintained regularly.
Activities to be undertaken	
Conduct surveys prior to construction	» Including, but not limited to a geotechnical survey, topographical survey and hydrological survey; site survey and confirmation of the panel micro-siting footprint and micro-siting of the pylons of the power line; and survey of the onsite facility substation site to determine and confirm the locations of all associated infrastructure.
Undertake site preparation	» Including the clearance of vegetation at the footprint of PV panel foundation, onsite substation, power line tower positions, establishment of the laydown area, the establishment of internal access roads and excavations for foundations. » Vegetation clearance to be undertaken in a systematic manner to reduce the risk of exposed ground being subjected to erosion. » Stripping of topsoil to be stockpiled, for use during rehabilitation. » Include search and rescue of floral species of concern (where required) and the identification and excavation of any sites of cultural/heritage value (where required).
Establishment of access roads to	» Internal gravel access roads between the arrays (3.5 m wide) and around the boundary of the site (2.5 m wide) will be established at the commencement of construction. » An existing access road, which might possibility be upgraded with hard surface, will be used to access the facility (up to 6 m wide).

the site and internal roads	» During construction, a permanent access road along the length of the power line corridor between 4 - 8m wide will be established to allow for large crane movement.
Establishment of laydown area and temporary concrete batching plant	» A laydown area for the storage of PV panels, Project components, cabling and other construction equipment. » The laydown will also accommodate building materials and equipment associated with the construction of buildings. » No borrow pits will be required. Infilling or depositing materials will be sourced from licenced borrow pits within the surrounding areas. » A temporary concrete batching plant of 25m x 25m in extent to facilitate the concrete requirements for foundations, if required.
Construct foundation	» Excavations to be undertaken mechanically. » For PV array installation vertical support posts will be driven into the ground. » Depending on geological conditions, the use of alternative foundations may be considered (e.g., screw pile, helical pile, micropile or drilled post/piles). » Ramming of the piles or predrilling with concrete filling with be considered if the ground is found to be hard.
Transport of components and equipment to and within the site	» The components for the solar PV facility and onsite substation will be transported to site by road. Transportation will take place via appropriate National and Provincial roads, and the dedicated access/haul road to the Project Site. » Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989) by virtue of the dimensional limitations. » Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation.
Erect PV Panels and Construct Substation, Invertors and BESS	» The construction phase involves installation of the solar PV panels and the structural and electrical infrastructure to make the plant operational. In addition, preparation of the soil and improvement of the access roads would continue for most of the construction phase. » For array installation, typically vertical support posts are driven into the ground. Depending on the results of the geotechnical study a different foundation method, such as screw pile, helical pile, micro-pile or drilled post/pile could be used. The posts will hold the support structures (tables) on which PV arrays would be mounted. Brackets attach the PV modules to the tables. » Trenches are dug for the underground Alternate Current (AC) and Direct Current (DC) cabling, and the foundations of the inverter enclosures and transformers are prepared. While cables are being laid and combiner boxes are being installed, the PV tables are erected. » Wire harnesses connect the PV modules to the electrical collection systems. » Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the onsite AC electrical infrastructure and ultimately the Project's onsite substation. This process also involves the installation of the BESS facility. The following simplified sequence is conducted for the construction of the substation: » Step 1: Conduct geotechnical investigations to determine founding conditions; » Step 2: Conduct site survey; » Step 3: Vegetation clearance and construction of access road;

	» Step 4: Site grading and levelling; » Step 5: Construction of foundations; » Step 6: Import of collector substation components; » Step 7: Construction of collector substation; » Step 8: Rehabilitation of disturbed area and protection of erosion sensitive areas; and » Step 9: Testing (including quality control) and commissioning (in consultation with the switching specialist).
Connection of PV panels to the onsite substation	» PV arrays to be connected to the onsite substation via underground electrical cables. » Excavation of trenches is required for the installation of the cables. Trenches will be approximately 1.5 m deep. » Underground cables are planned to follow the internal access roads, as far as possible. » Onsite substation to be connected to the collector substation via underground cables.
Construction overhead power line to connect the onsite facility substation to the existing 88kV substation	An 88kV single circuit overhead power line will be constructed to connect the onsite facility substation to an existing 88kV substation. Overhead power lines are constructed in the following simplified sequence: » Step 1: Surveying of the development corridor and negotiating with affected landowner; » Step 2: Final design and micro-siting of the infrastructure based on geo-technical, topographical conditions and potential environmental sensitivities; obtain required environmental permits (such as biodiversity permits, heritage permits & WUL/GA); » Step 3: Vegetation clearance and construction of access roads/tracks (where required); » Step 4: Construction of pylon foundations; » Step 5: Assembly and erection of infrastructure within and along the corridor; » Step 6: Stringing of conductors; » Step 7: Rehabilitation of disturbed areas; and » Step 8: Continued maintenance.
Establishment of ancillary infrastructure	» An O&M building, which will include a site security office, warehouse, storage area and workshop will be required. » Establishment of ancillary infrastructure will require the clearing of vegetation, levelling, and the excavation of foundations prior to construction.
Undertake site rehabilitation	» Commence with rehabilitation efforts once construction is completed in an area, and all construction equipment is removed. » On commissioning, access points to the site not required during the operation phase will be closed and prepared for rehabilitation.
<u>Operation Phase</u>	
Requirements	» Duration will be up to 15 years or as required by the off-taker (with the possibility to extend should it be required). » Requirements for security and maintenance of the Project. » Employment opportunities relating mainly to operation activities and maintenance. The number of employment opportunities to be created during the operation phase will be derived as the Project modelling progresses during the EIA Phase and is anticipated to be approximately 20 permanent jobs. » Overnight on-site worker presence would be limited to security staff.

	» During the operational phase, water will mostly be required for the cleaning of panels and will be sourced from the onsite boreholes (x3) where it will be stored in storage tanks. » Sewage due to the presence of maintenance personnel on-site will be produced during the operation phase.
Activities to be undertaken	
Operation and Maintenance	» Full time security, maintenance, and control room staff. » All PV panels will be operational except under circumstances of mechanical breakdown, inclement weather conditions, or maintenance activities. » Solar PV to be subject to periodic maintenance and inspection. » It is anticipated that the PV panels will be washed more than twice a year during operation using clean water with no cleaning products or using non-hazardous biodegradable cleaning products. The exact number of cleaning cycles will be confirmed once more knowledge on the soiling on the Project Site is obtained. » Areas which were disturbed during the construction phase to be utilised, should a laydown area be required during operation.
<u>Decommissioning Phase</u>	
Requirements	» Decommissioning of the Project at the end of its economic life. » Potential for repowering of the facility, depending on the condition of the facility at the time. » Expected lifespan of approximately 15 years (with maintenance) or as required by the off-taker before decommissioning is required. » A decommissioning Environmental Management Programme (EMPr) will be drafted and complied with at that decommissioning stage of the project lifecycle. » Decommissioning activities to comply with the legislation relevant at the time.
Activities to be undertaken	
Site preparation	» Confirming the integrity of access to the site to accommodate the required decommissioning equipment. » Preparation of the site (e.g., laydown areas and construction platform). » Mobilisation of construction equipment.
Disassemble and remove PV panels	» Components to be reused, recycled, or disposed of in accordance with regulatory requirements. » Much of the above ground wire, steel, and PV panels of which the system is comprised are recyclable materials and would be recycled to the extent feasible. » Concrete will be removed to a depth as defined by an agricultural specialist and the area rehabilitated. Cables will be excavated and removed, as may be required

It is expected that the area affected by the Project (Development Footprint) will revert back to its original land-use once the Project has reached the end of its economic life and all infrastructure has been decommissioned.

2.2. Technology considered for the Solar Energy Facility and the Generation of Electricity

The Project will have a contracted capacity of up to 40 MWp and will make use of PV technology. Solar energy facilities use energy from the sun to generate electricity through a process known as the **Photovoltaic Effect**. This effect refers to photons of light colliding with electrons, therefore placing the electrons into a higher state of energy to create electricity refer to **Figure 2.3**).

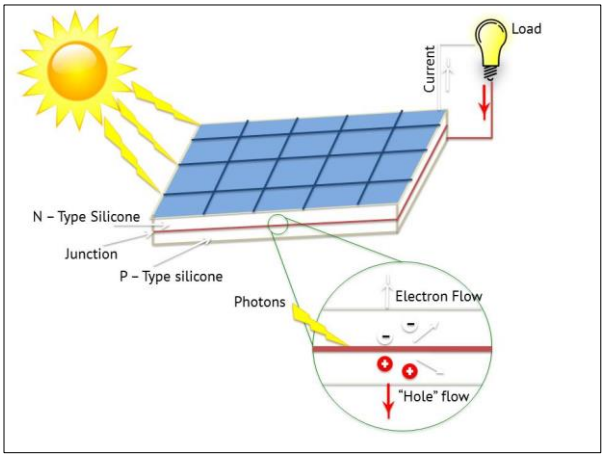


Figure 0.3: Diagram illustrating the Photovoltaic Effect (Source: Centre for Sustainable Energy).

The solar field of the PV facility will comprise the following components:

PV Cells, Modules and Arrays:
A PV cell is made of silicone that acts as a semiconductor used to produce the photovoltaic effect. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV module (Solar Panel). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)). A solar PV module is made up of individual solar PV cells connected together, whereas a solar PV array is a system made up of a group of individual solar PV modules electrically wired together to form a much larger PV installation.

PV modules are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

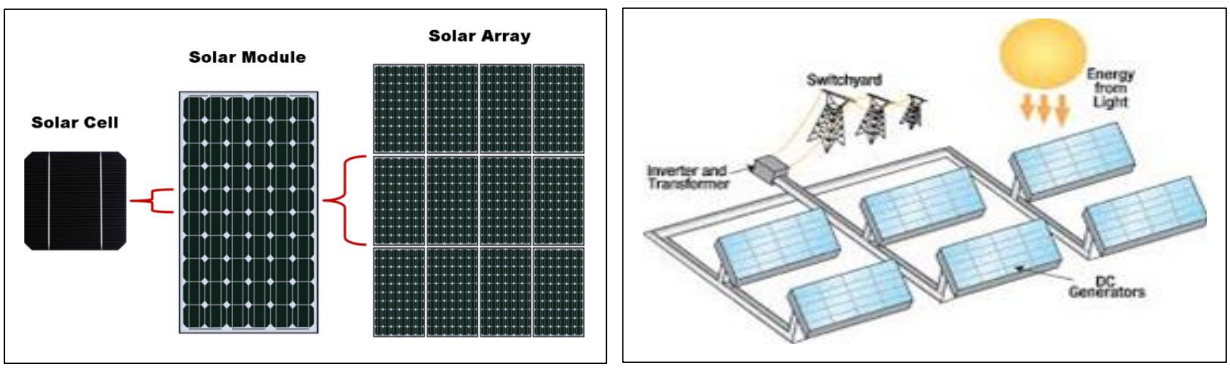


Figure 2.4: Overview of a PV cell, module, and array (Source: pveducation.com).

Inverters

Inverters are used to convert the electricity produced by the PV cells from DC into Alternating Current (AC) to enable the distribution of the electricity generated to the private off-taker's electricity point of interconnection. Numerous inverters will be arranged in several arrays to collect and convert power produced by the Solar PV Energy Facility.

Support Structures

The PV panels will be fixed to support structures to maximise exposure to the sun. They can either utilise fixed / static support structures or alternatively single or double axis tracking support structures. PV panels that utilise fixed / static support structures are set at an angle (fixed-tilt PV system), to optimise the amount of solar irradiation. With fixed / static support structures, the angle of the PV panel is dependent on the latitude of the proposed Project and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels that utilise tracking support structures track the movement of the sun throughout the day, to receive the maximum amount of solar irradiation.

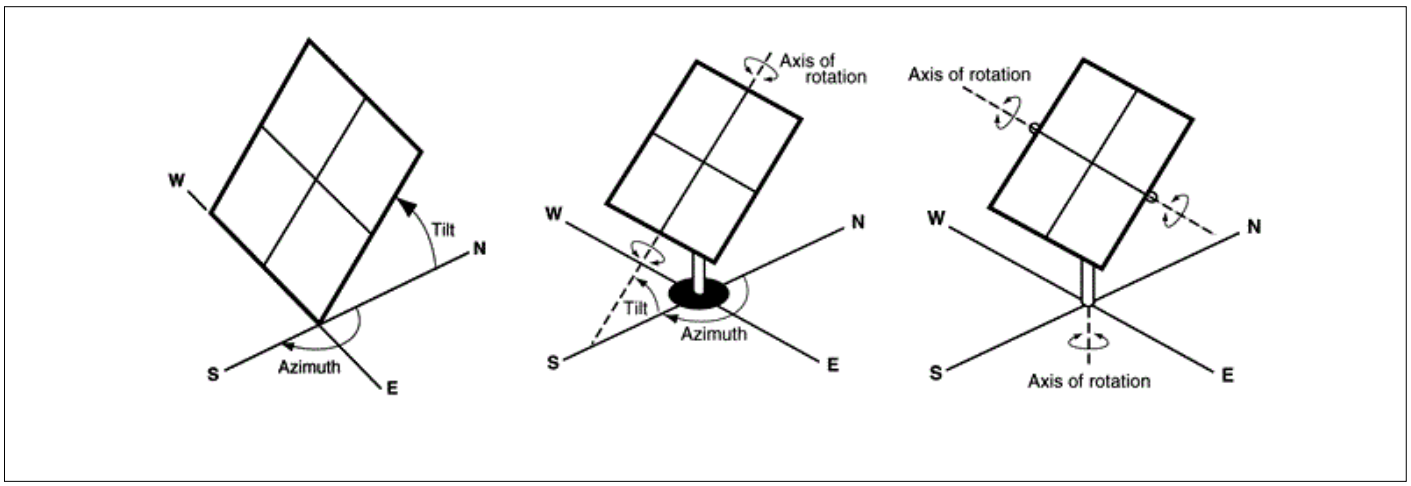


Figure 2.5: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

Bifacial Solar Panel Technology

Buffelspoort Solar Project (Pty) Ltd is considering the use of bifacial tracking technology. Bifacial ("two-faced") modules produce solar power from both sides of the panel. Traditional solar panels capture sunlight on one light-absorbing side. The light energy that cannot be captured is simply reflected away. Bifacial solar panels have solar cells on both sides, which enables the panels to absorb light from the back and the front (refer to **Figure 2.6**). Practically speaking, this means that a bifacial solar panel can absorb light reflected off the ground or another material. In general, more power can be generated from bifacial modules for the same area, without having to increase the development footprint.

The optimum tilt for a bifacial module has to be designed so as to capture a big fraction of the reflected irradiation. Use of trackers is recommended so the modules can track the sun's movement across the sky, enabling them to stay directed to receive the maximum possible sunlight to generate power.

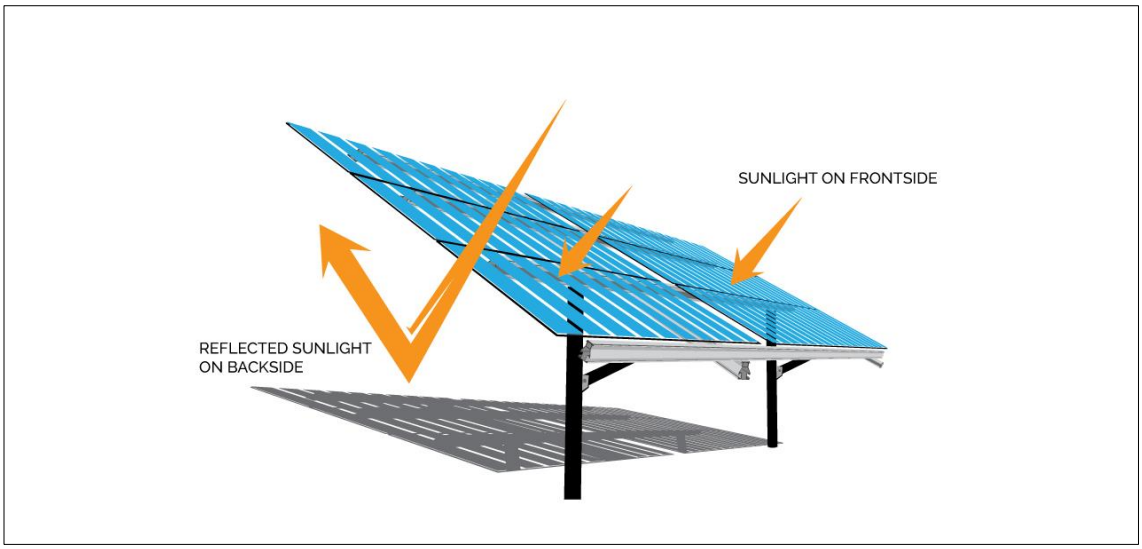


Figure 2.6: Diagram showing how bifacial Solar PV panels work (Source: https://sinovoltaics.com/learning-center/solar-cells/bifacial-solar-modules/).

Battery Energy Storage System

The need for a BESS, stems from the fact that electricity is only produced by the Solar PV Energy Facility while the solar resource is available, while the peak demand may not necessarily occur during the daytime or as the resource is available. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

- Store and integrate a greater amount of renewable energy from the Solar PV Energy Facility into the mine distribution system.
- This will assist with the objective to generate electricity by means of renewable energy to feed into the mine distribution system.
- Proposed footprint of battery storage area: up to 2ha.
- Proposed capacity of battery storage: 30MW / 4h of usable energy at Beginning of Life.

The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the off-taker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the off-taker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

The type of battery storage will only be determined at a later stage and will be based solely on the technological advancements made in the battery technology field. The storage solution will remain a containerised solution.

Table 2.3: Photographs of the construction phase of a solar facility similar to the Buffelspoort Solar PV Energy Facility
(Source:https://medium.com/@solar.dao/how-to-build-pv-solar-plant-6c9f6a01020f; https://www.shutterstock.com/video/clip-1028794-workers-mounting-panels-on-solar-power-plant-construction; https://www.esi-africa.com/renewable-energy/kenya-construction-solar-farm-gets-green-light/).





2.3 Alternatives Considered during the Scoping & EIA Process

In accordance with the requirements of Appendix 3 of the 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326), reasonable and feasible alternatives including but not limited to site and technology alternatives, as well as the "do-nothing" alternative should be considered. Several other solar renewable energy facilities are planned within the broader study area, supporting the suitability of the area for solar PV projects.

The DFFE Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be "practicable", "feasible", "relevant", "reasonable" and "viable". Essentially there are two types of alternatives:

» Incrementally different (modifications) alternatives to the project.
» Fundamentally (totally) different alternatives to the project.

2.3.1 Consideration of Fundamentally Different Alternatives

Fundamentally different alternatives are usually assessed at a strategic level and, as a result, project specific EIAs are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP)[11], and will continue to be addressed as part of future revisions. In this regard, the need for renewable energy power generation from solar PV facilities has been identified as part of the technology mix for power generation in the country for the next 20 years. The Integrated Resource Plan (IRP) includes provision for distributed generation capacity for own use. The threshold for distributed generation was raised to 100MW in August 2021. Project developers are exempted from applying for a license but are required to register with the National Energy Regulator of South Africa (NERSA) and comply with the relevant grid code(s).

The fundamental energy generation alternatives were assessed and considered within the development of the IRP and the need for the development of renewable energy projects has been defined. Therefore, fundamentally different alternatives to the proposed Project are not considered within this EIA process.

2.3.2 Consideration of Incrementally Different Alternatives

Incrementally different alternatives relate specifically to the Project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives for:

» The property on which, or location where the activity is proposed to be undertaken.
» The type of activity to be undertaken.
» The design or layout of the activity.
» The technology to be used in the activity.

In addition, the option of not implementing the activity (i.e. the "do-nothing" alternative) must also be considered.

[11] The Integrated Resource Plan (IRP) is legislated policy which regulates power generation planning.

These alternatives are discussed under the respective sub-headings below and where no alternatives are applicable, a motivation has been included.

i. Property or Location Alternatives

The project site is located ~6 km west of the town of Moonooi in the North West Province. Originally, three (3) development area alternatives were identified, which were deemed to be suitable for the development of a Solar PV Energy Facility (refer to **Figure 2.7**). These sites were selected based on the following criteria:

» Solar resource.
» Proximity to the private off-taker and point of interconnection.
» Land availability and ownership.
» Site topography.
» Limited environmental sensitivities.
» Access to infrastructure and utilities.

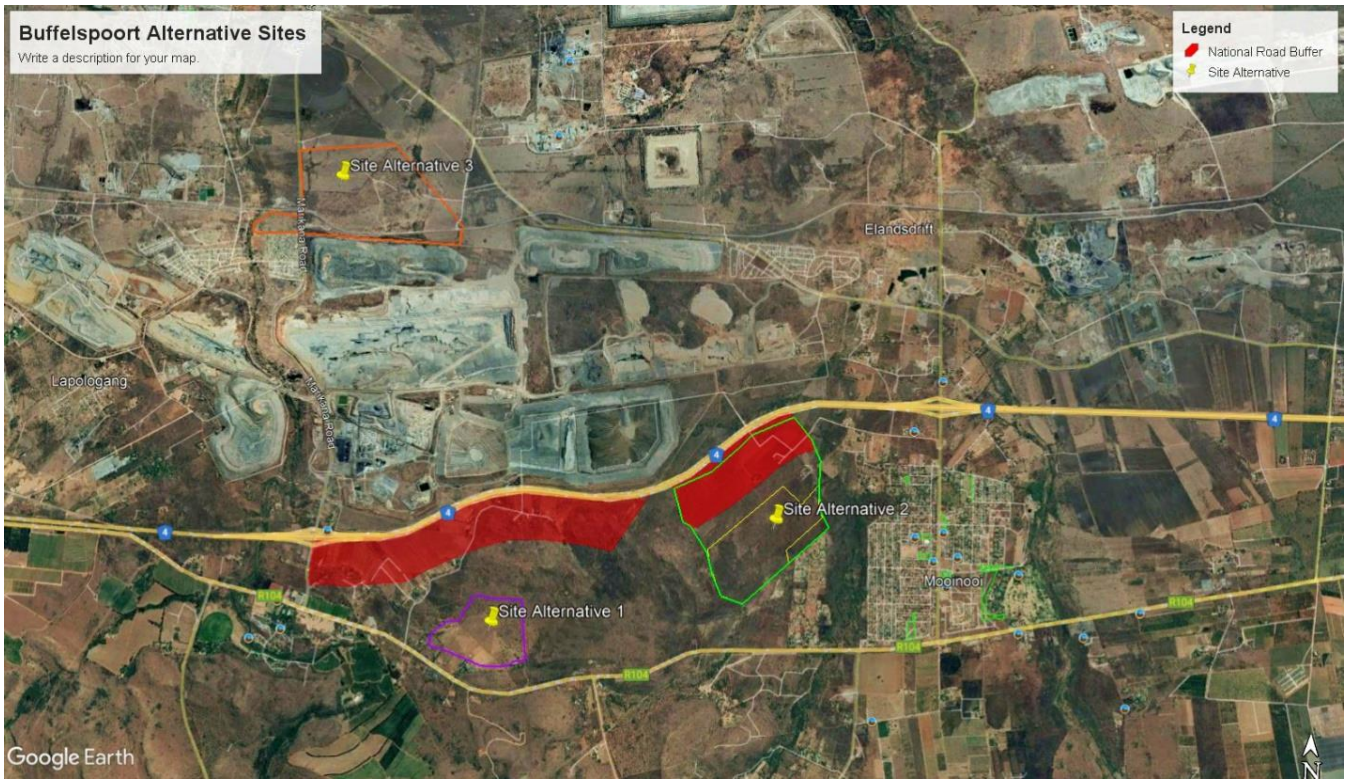
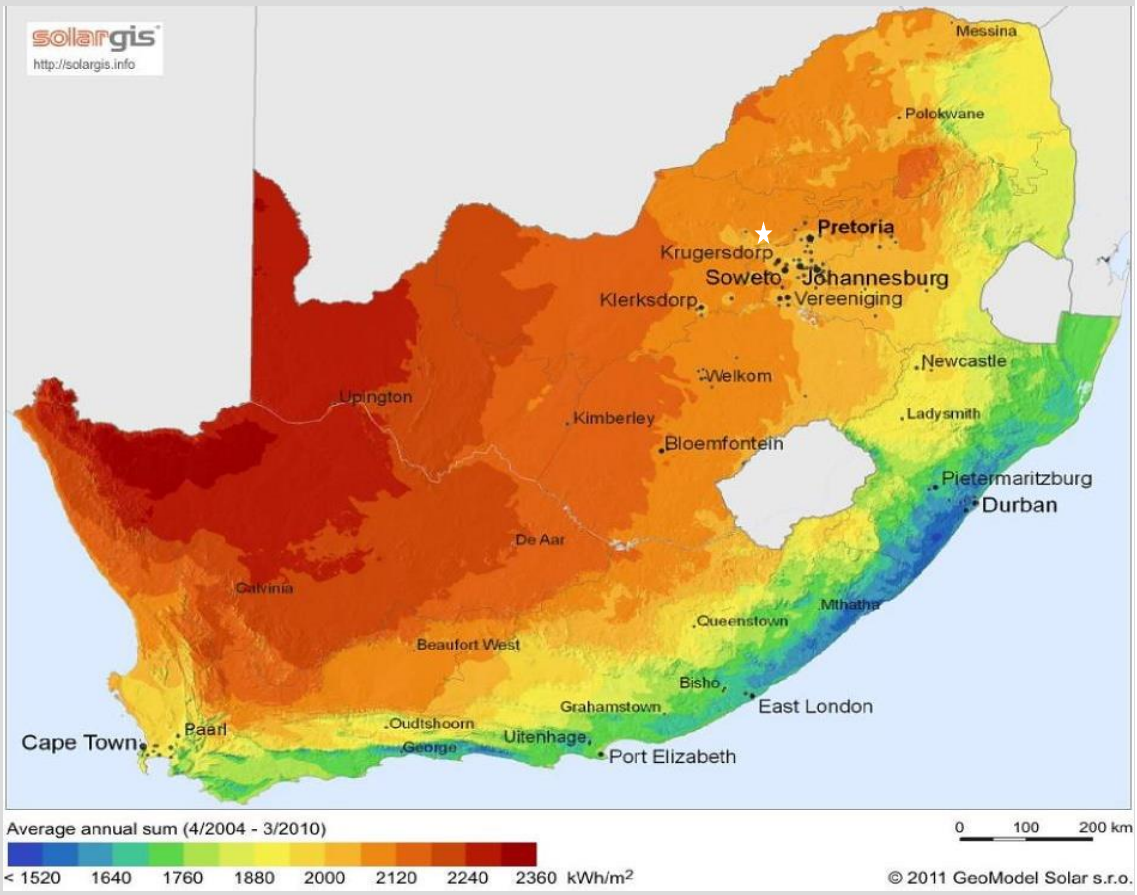


Figure 2.7: Potential sites investigated prior to initiation of the S&EIA process.

The three (3) development area alternatives were subject to a desktop assessment prior to initiation of the S&EIA process. As part of the desktop assessment, the DFFE Screening Tool, along with the South African National Biodiversity Institute (SANBI) database and the Integrated Biodiversity Assessment tool were used. The results of the desktop assessment are detailed in **Table 2.4** below.

Table 2.4: Site selection determination

Assessment Criteria	Site Alternative 1	Site Alternative 2	Site Alternative 3
Solar resource	Solar resource is the first main driver of site selection and property viability when considering the development of Solar PV Energy Facilities. The economic viability of a Solar PV Energy Facility is directly dependent on the annual direct solar irradiation values of the area within which it will operate. The Global Horizon Irradiation (GHI) for the study area is in the region of 2 000 – 2 120 kWh/m^2/annum (refer to **Figure 2.8**). This is considered feasible for the development of a Solar PV Energy Facility.  **Figure 2.8:** Solar irradiation map for South Africa; the proposed Project position is shown by the white star on the map (Source: adapted from GeoModel Solar, 2011).		
Property details	» Portion 75 of Buffelspoort 343 JQ » Portion 134 of Buffelspoort 343 JQ » Portion 94 of Elandsdrift 467 JQ » Portion 29 of Elandsdrift 467 JQ » Portion 178 of Elandsdrift 467 JQ	» Portion 62 of Elandsdrift 467 JQ » Portion 116 of Elandsdrift 467 JQ » Portion 25 of Elandsdrift 467 JQ	» Portion 333 of the Farm Rooikoppies 297 JQ
Property size	~226 ha	~149 ha	~188 ha
Availability and ownership	Owned by the private off-taker	Privately-owned land	Sibanye Mine owned land
Proximity to the private off-taker	~3.5 km	~8 km	~3.1 km
Land use	» Development area: game farming	» Development area: small holding	» Development area: small holding

Assessment Criteria	Site Alternative 1	Site Alternative 2	Site Alternative 3
	» Surrounding land use: - mining operations, - agriculture and - small holdings	» Surrounding land use: - mining operations, - agriculture - informal settlements	» Surrounding land use: - mining operations, - agriculture - small holdings
Topography	Flat with rocky outcrops to the east, north and south of the site	The site is situated between two stream systems to the west and the east and flat.	Most of the site being flat and certain areas have been transformed
Access to infrastructure and utilities	» Randwater pipeline transects the property to the east » Site is serviced by three boreholes » Site is fenced » Site is accessed via the N4 Bakwena Toll Road, Marikana off ramp road and the R104 » 11kV power line transects the site » Helipad has been constructed	» Site is accessed via the N4 Bakwena Toll Road, Marikana offramp road	» In close proximity to N4 (700m) » Site is accessed via N4 Bakwena Toll road, Lonhro drive road and a gravel road that T's of from there
Interconnection:	» 11/88kV Switching station proposed on the north western boundary of Portion 75 of the Farm Buffelspoort 343 JQ » The facility will connect via a 2.5 km 88kV overhead power line to be constructed. » Overhead power line will be routed across properties owned by the off-taker, where possible.	» ~3 km 132kV overhead power line to be constructed within existing road servitude.	» 8-9km 132kV overhead power line to be constructed » Overhead power line will traverse natural area for a portion of the alignment » Remainder of overhead power line will be routed within existing servitudes adjacent existing infrastructure.
Environmental constraints	<u>Fauna:</u> » Outside the 20 km radius for the Cape Vulture Restaurant <u>Vegetation:</u> » Marikana Thornveld » occurs as open Acacia karoo woodland, » Shrubs are denser along drainage lines, on termitaria and rocky outcrops » Part of an Ecological Support Area » Possible CBA2 fringe areas. » Site was previously transformed: more than 50%. <u>Water features</u> » 2 artificial dams are on site	<u>Fauna:</u> » Situated within 20 km of a known Cape Vulture Restaurant. <u>Vegetation</u> » Marikana Thornveld » occurs as open Acacia karoo woodland, » Shrubs are denser along drainage lines, on termitaria and rocky outcrops » Part of an Ecological Support Area » Possible CBA2 area <u>Water features</u>	<u>Fauna:</u> » Situated within 20 km of a known Cape Vulture Restaurant. <u>Vegetation</u> » Marikana Thornveld » occurs as open Acacia karoo woodland, » Shrubs are denser along drainage lines, on termitaria and rocky outcrops » Part of an Ecological Support Area » Possible CBA2 area <u>Water features</u>

Assessment Criteria	Site Alternative 1	Site Alternative 2	Site Alternative 3
	Heritage » Remnants of a graveyard was identified	» There are wetlands within 500m from the site. » The area is also listed as an Aquatic CBA Heritage » None identified	» Situated between two stream systems to the west and the east. Heritage » None identified
Other considerations	N/A	Site was in very close proximity to the town Mooinooi (500 m)	» Site in close proximity to the mining operations. » Increased soiling » Significant impact on generation capacity & feasibility of project

Based on the above considerations, site alternative 1 was identified as the preferred development area and a high-level environmental screening of the site was undertaken by BioBlue Environmental on 12 December 2021 to determine the environmental sensitivity of the preferred development area. The high-level screening report was supplemented with land-use permitting information, an infrastructure assessment and a secondary visit. Based on the findings of the site assessment and screening process, site alternative 1 was further defined and adjusted. Portions 94, 29 and 178 of Farm Elandsdrift 467JQ were excluded from the preferred development area due to the topographical constraints and the Randwater Bulk Supply water pipeline that runs on the boundary of these properties. Access to this water pipeline is required by Samancor and Randwater for maintenance purposes and would have divided the site into two separate facilities that need to be contained.

The preferred development area of 226 ha was reduced to 122 ha, in order to ensure that the proposed Project is developed within one municipality and taking the topographical constraints into consideration. High-level environmental buffers were applied to the natural and artificial features identified on site as to reduce the potential impact the development will have on these. This further reduced the Development Area to 77 ha. Only once the preferred Development Area was identified was the power line corridor defined. The power line corridor will run across properties owned by the private off-taker and traverse the N4 Bakwena Highway and SANRAL owned properties.

The preferred Development Area (77 ha) (i.e., site alternative 1 as indicated in **Figure 2.7** and grid corridor have been subject to further investigation by specialist consultants as part of the Scoping Phase and EIA Phase of the S&EIA process. This included field investigations, as well as desktop consideration of environmental constraints. The purpose of this phase of the process was to identify sensitive and no-go areas, as well as to determine appropriate buffers to be considered within the development of the Project layout. The Development Footprint has been determined based on the outcomes of the Scoping study and has undergone further investigation during the EIA Phase.

ii. Design and Layout Alternatives

A Project Site of approximately 223 ha has been considered for the Buffelspoort Solar PV Energy Facility. Findings from specialist assessments and field surveys undertaken were considered through this Scoping & EIA process in order to provide site specific information regarding the Project Site considered for the Project.

Areas to be avoided that were identified during the Scoping phase, and present within the Project Site have been considered by the Developer to identify and locate the development area for the 40 MWp PV facility. This has been undertaken with the aim of avoiding possible sensitive areas within the Project Site so as to limit impacts associated with the development which would result in unacceptable loss, and thereby ensuring that the layout plan taken forward for assessment during the EIA Phase is considered to be the most optimal from an environmental perspective.

The layout optimisation process applied by the Project Developer as detailed above demonstrates due consideration of the suitability of the Project Site for the Project in line with a typical mitigation hierarchy:

1. First Mitigation: avoidance of adverse impacts as far as possible by use of preventative measures (in this instance an environmental screening and integration process assisted in the avoidance of identified sensitive areas).
2. Second Mitigation: minimisation or reduction of adverse impacts to 'as low as practicable' through implementation of mitigation and management measures (in this instance the development of technical mitigation solutions as well as recommendations from the various environmental specialists).
3. Third Mitigation: remedy or compensation for adverse residual impacts, which are unavoidable and cannot be reduced further.

As part of the process, as described above, the first tier of avoidance has already been applied. No feasible alternative layouts have been identified for investigation as part of the EIA process.

2.3.3 Technology Alternatives

As the Project Developer is investigating the development of a renewable energy facility as the preferred power supply technology solution, no other technology alternatives are proposed. Solar power has been determined as the preferred renewable energy technology based on the availability of the solar resource. Few technology options are available for Solar PV Energy Facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail in the area, so that optimality is obtained by the final site selection. Solar energy is considered to be the most suitable renewable energy technology for this area, based on the site location, ambient conditions and energy resource availability.

When considering PV as a technology choice, several types of panels are available, including *inter alia*:

» Bifacial PV panels
» Monofacial PV panels
» Fixed mounted PV systems (static / fixed-tilt panels).
» Single-axis tracking or double-axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement).

The primary difference between PV technologies available relate to the extent of the facility, as well as the height of the facility; however, the potential for environmental impacts remains similar in magnitude. Fixed mounted PV systems are able to occupy a smaller extent and have a lower height when compared to tracking PV systems, which require both a larger extent of land, and are taller in height. However, both options are considered to be acceptable for implementation from an environmental perspective. Bi-facial solar PV panels offer many advantages over mono-facial PV panels as power can be produced on both sides of the module, increasing total energy generation. Monocrystalline polycrystalline or thin film modules

differ mainly in their cost and efficiency values, but do not represent a fundamentally different panel design type from an environmental perspective. The preference will, therefore, be determined on technical considerations and the site conditions during the final design phase of the project. The PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance. The impacts associated with the construction, operation, and decommissioning of the facility are anticipated to be the same irrespective of the PV panel selected for implementation.

2.3.4 The 'Do-Nothing' Alternative

The 'Do-Nothing' alternative is the option of not constructing the Buffelspoort Solar Energy Facility on the proposed Project Site and assumes the site remains in its current state. Should this alternative be selected, there would be no environmental impacts or benefits as a result of construction and operation activities associated with a solar PV facility. This alternative is assessed in detail within Chapter 9 of this EIA Report.

CHAPTER 3: POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of a Solar PV Energy Facility such as the Buffelspoort Solar PV Energy Facility and its associated infrastructure is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed Project.

3.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Environmental Impact Assessment Report

This chapter of the Environmental Impact Assessment Report includes the following information required in terms of Appendix 3: Scope of Assessment and Content of the Environmental Impact Assessment Report

Requirement	Relevant Section
3(1)(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Chapter 3 provides an overview of the policy and legislative context which is considered to be associated with the development of the Buffelspoort Solar PV Energy Facility

3.2 Strategic Electricity Planning in South Africa

The need to expand electricity generation capacity in South Africa is based on national policy and informed by on-going strategic planning undertaken by the Department of Mineral Resources and Energy (DMRE). The policies or plans that have relevance to the development of the Project are discussed in more detail in the following sections. Although the Solar PV Energy Facility is proposed for use by a private off-taker, it is still important to demonstrate how this proposed Project fits within this policy framework.

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels.

At **National Level**, the main regulatory agencies are:

- **National Energy Regulator of South Africa (NERSA):** NERSA is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for projects to generate electricity. Schedule 2 of the Electricity Regulation Act provides for exemptions from the obligation in the Act to apply for (and hold) a licence from the National Energy Regulator (NERSA). In terms of this schedule, the threshold for distributed generation was raised to 100 MW on 10 June 2021. Project developers for projects up to 100 MW are exempted from applying for a license but are required to register with NERSA and comply with the relevant grid code(s).
- **Department of Forestry, Fisheries and the Environment (DFFE):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations, 2014 (GN

R326) as amended. The DFFE is also responsible for issuing permits for impacts on protected trees and protected species under the National Environmental Management: Biodiversity Act (NEM: BA).

- **The South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- **South African National Roads Agency Limited (SANRAL):** This Agency is responsible for the regulation and maintenance of all national road routes.
- **Department of Water and Sanitation (DWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e., Water Use Licenses (WUL) and General Authorisation).
- **The Department of Agriculture, Rural Development and Land Reform (DARDLR):** This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agriculture sector. Furthermore, the Department is also responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15 (1) of the National Forest Act (No. 84 of 1998) (NFA).

At **Provincial Level**, the main regulatory agencies are:

- **North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT)** is the CA for the Project and is also responsible for issuing any biodiversity and conservation-related permits. The involvement relates specifically to sustainable resource management, conservation of protected species, and land care. According to the Explanatory Document for Government Notice No. 779 published in Government Gazette No. 40110 dated 01 July 2016, if the project developer will not, or does not, intend to participate in any of the Integrated Resource Plan programmes (IRP), the CA will be the Member of the Executive Council (MEC) responsible for environmental affairs in the respective province, unless another sub-section of section 24C of NEMA specifies the Minister to be the CA. Since the purpose of the Project is to generate power for use by a private off-taker, and since the Project will not be bid into the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or a similar government programme, the NW DEDECT has been determined as the CA.
- **North West Department of Public Works and Roads (NW DPWR)** is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- **North West Provincial Heritage Resources Agency (NW PHRA)** is responsible for the identification, conservation, and management of heritage resources, as well as commenting on heritage related issues within the province.
- **North West Department of Community Safety and Transport Management (NW DCSTM)** provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

At the **Local Level,** the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. Both the local and district municipalities play a role. The local municipality includes the **Rustenburg Local Municipality** which forms part of the **Bojanala Platinum District Municipality**. In terms of the Municipal Systems Act (No. 32 of 2000), it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

3.3 International Policy and Planning Context

A brief review of the most international policies relevant to the establishment of the Project is provided below in **Table 4.1**. The Project is considered to be aligned with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 4.1: International policies relevant to the Project

Relevant policy	Relevance to the Buffelspoort Solar PV Energy Facility
United Nations Framework Convention on Climate Change (UNFCCC) and Conference of the Party (COP)	The Conference of the Parties (COP), established by Article 7 of the UNFCCC, is the supreme body and highest decision-making organ of the Convention. It reviews the implementation of the Convention and any related legal instruments and takes decisions to promote the effective implementation of the Convention. The COP21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Paris Agreement set out that every 5 years countries must set out increasingly ambitious climate action. This meant that, by 2020, countries needed to submit or update their plans for reducing emissions, known as nationally determined contributions (NDCs). The COP26 summit held on 2021 brought parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. On 13 November 2021, COP26 concluded in Glasgow with all countries agreeing the Glasgow Climate Pact to keep 1.5˚C alive and finalise the outstanding elements of the Paris Agreement. South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. The policy provides support for the Project which will contribute to managing climate change impacts and assist in reducing GHG emissions in a sustainable manner.
The Equator Principles IV (July 2020)	The Equator Principles (EPs) IV constitute a financial industry benchmark used for determining, assessing, and managing a project's environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. In addition, these principles are used to ensure that projects financed by the Equator Principles Financial Institutions (EPFI) are developed in a manner that is socially responsible and reflects sound environmental management practices. The EPs are applicable to infrastructure projects (such as the proposed Project) and apply globally to all industry sectors.

Relevant policy	Relevance to the Buffelspoort Solar PV Energy Facility
	Such an assessment should propose measures to minimise, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of the Project. In terms of the EPs, South Africa is a non-designated country (as at 4 March 2020), and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines. The Project is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended, published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.
International Finance Corporation (IFC) Performance Standards and Environmental and Social Sustainability (January 2012)	The International Finance Corporation's (IFC) Performance Standards (PSs) on Environmental and Social Sustainability were developed by the IFC and were last updated on 1 January 2012. Performance Standard 1 requires that a process of environmental and social assessment be conducted, and an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project, and commensurate with the level of its environmental and social risks and impacts be established and maintained. The above-mentioned standard is the overarching standard to which all the other standards relate. Performance Standards 2 through 8 establish specific requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, the standards 2 and 8 describe potential social and environmental impacts that require particular attention specifically within emerging markets. Where social or environmental impacts are anticipated, the project developer is required to manage them through its ESMS consistent with Performance Standard 1. Given the nature of the Project, it is anticipated (at this stage of the process) that Performance Standards 1, 2, 3, 4, 6, and 8 may be applicable to the project (see box 1 below). • Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts • Performance Standard 2: Labour and Working Conditions • Performance Standard 3: Resource Efficiency and Pollution Prevention • Performance Standard 4: Community Health, Safety and Security • Performance Standard 5: Land Acquisition and Involuntary Resettlement – N/A • Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources • Performance Standard 7: Indigenous Peoples – N/A • Performance Standard 8: Cultural Heritage

3.4 National Policy and Planning Context

A brief review of the most relevant national policies is provided below in **Table 4.2**. The development of the Project is considered to align with the aims of these policies, even where contributions to achieving the goals therein are only minor.

Table 4.2: National policies relevant to the Project

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
Constitution of the Republic of South Africa, 1996	Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts. The undertaking of an EIA process for the proposed Project in terms of the requirements of the EIA Regulations, 2014 (as amended) aims to minimise any impacts on the natural and social environment.
National Environmental Management Act (No. 107 of 1998) (NEMA)	This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights. The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA. The Project is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended, published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA). Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.
White Paper on the Energy Policy of the Republic of South Africa (1998)	The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of renewable energy and encouraging new entries into the generation market. The policy states that the advantages of renewable energy include, minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include higher capital costs in some cases, lower energy densities, and lower levels of availability, depending on specific conditions, especially with sun

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future.
White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	The White Paper on Renewable Energy Policy supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of renewable energy and aims to create the necessary conditions for the development and commercial implementation of renewable energy technologies. The White Paper on Renewable Energy sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing renewable energy in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and fairly accessible and affordable coal resources. However, massive renewable energy resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. The development of additional renewable energy projects will promote the use of the abundant South African renewable energy resources and contribute to long-term energy security and diversification of the energy mix.
The Electricity Regulation Act (No. of 2006)	The Electricity Regulation Act of 2006, replaced the Electricity Act (No. 41 of 1987), as amended, except for Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry. The Act establishes a national regulatory framework for the electricity supply industry and introduces the National Energy Regulator (NERSA) as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licences and registration as the manner in which the generation, transmission, distribution, trading, and import and export of electricity are regulated. Schedule 2 of the Electricity Regulation Act provides for exemptions from the obligation in the Act to apply for (and hold) a licence from National Energy Regulator (NERSA). In terms of this schedule, the threshold for distributed generation was raised to 100MW on 10 June 2021[12]. Project developers proposing projects up to 100MW are exempted from applying for a license but are required to register with NERSA and comply with the relevant grid code(s).
National Development Plan 2030	The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes: » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households. » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

[12] President Ramaphosa announced in July 2022 that government will remove the licensing threshold for embedded generation completely.

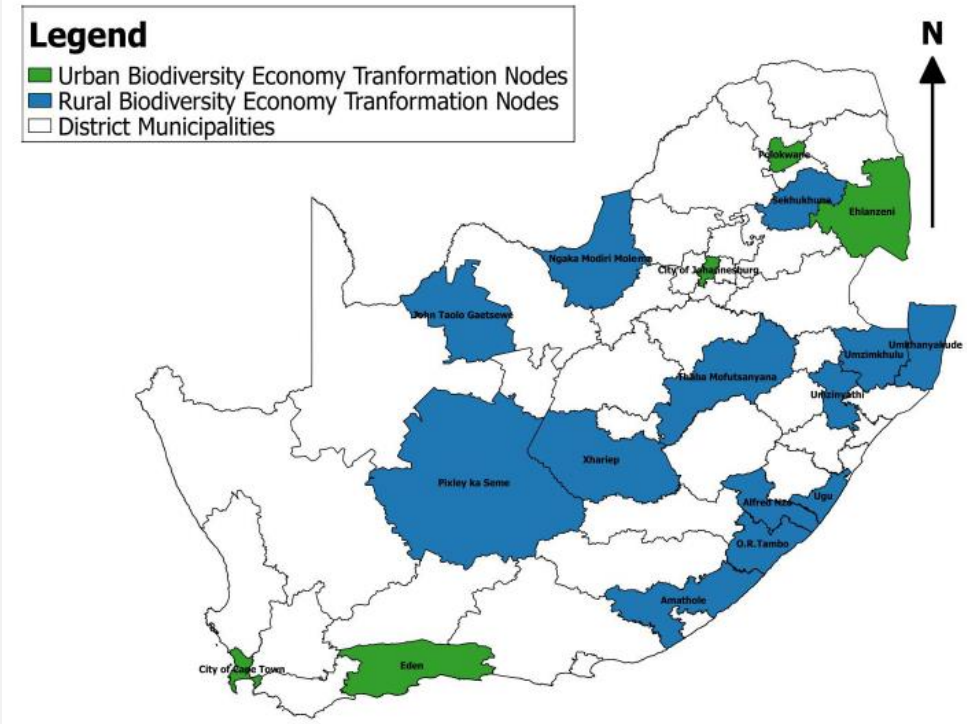
Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	In formulating its vision for the energy sector, the NDP took the IRP 2010 as its point of departure. Therefore, although electricity generation from coal is still seen as part of the energy mix within the NDP, the plan sets out steps that aim to ensure that, by 2030, South Africa's energy system will look very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, and imported hydroelectricity – will play a much larger role. The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of the Project supports the NDP through the development of energy-generating infrastructure which will not lead to the generation of GHGs and will result in economic development and growth of the area surrounding the project site.
Integrated Energy Plan (IEP), November 2016	The purpose and objectives of the Integrated Energy Plan (IEP) are derived from the National Energy Act (No. 34 of 2008). The IEP takes into consideration the crucial role that energy plays in the entire economy of the country and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple aims, some of which include: » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector. » To guide the selection of appropriate technologies to meet energy demand (i.e., the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels). » To guide investment in and the development of energy infrastructure in South Africa. » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors. A draft version of the IEP was released for comment on 25 November 2016. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others. The 8 key objectives of the integrated energy planning process are as follows: » Objective 1: Ensure security of supply. » Objective 2: Minimise the cost of energy. » Objective 3: Promote the creation of jobs and localisation. » Objective 4: Minimise negative environmental impacts from the energy sector. » Objective 5: Promote the conservation of water. » Objective 6: Diversify supply sources and primary sources of energy. » Objective 7: Promote energy efficiency in the economy. » Objective 8: Increase access to modern energy.

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
Integrated Resource Plan for Electricity (IRP) 2010-2030	The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing, and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The need for a Just Transition to a sustainable, low carbon and equitable energy system is also recognised. Following the promulgation of the IRP 2010–2030, implementation followed in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation (Act No. 4) of 2006. The Ministerial Determinations give effect to planned infrastructure by facilitating the procurement of the required electricity capacity. Provision has been made for the following new capacity by 2030 in the current IRP: » 1 500MW of coal » 2 500MW of hydro » 6 000MW of solar PV » 14 400MW of wind » 1 860MW of nuclear » 2 088MW of storage » 3 000MW of gas/diesel » 4 000MW from other distributed generation, co-generation, biomass and landfill technologies Of relevance to the proposed Project is the provision for distributed generation capacity for own use. Therefore, the development of the Project is supported by the IRP 2019.
New Growth Path (NGP) Framework, 23 November 2010	The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs by 2020; with economic growth and employment creation as the key indicators identified in the NGP. The framework seeks to identify key structural changes in the economy that can improve performance in terms of labour absorption and the composition and rate of growth. To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas.
National Climate Change Bill, 2018	On 08 June 2018, the Minister of Environmental Affairs published the National Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	procedural outline that will be developed through the creation of frameworks and plans. The Project is a renewable energy generation facility and would not result in the generation or release of emissions during its operation.
National Climate Change Response Policy, 2011	South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this, the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. As an integral part of the policy, a set of near-term priority flagship programmes will be implemented to address the challenges of climate change, one of which includes the Renewable Energy Flagship Programme. This flagship programme includes a scaled-up renewable energy programme, based on the current programme specified in the IRP 2010, and using the evolving South African Renewables Initiative led by the Department of Public Enterprise and Department of Trade and Industry (DTI), as a driver for the deployment of renewable energy technologies. The programme will be informed by enhanced domestic manufacturing potential and the implementation of energy efficiency and renewable energy plans by local government. The development of the Project is aligned with the Renewable Energy Flagship Programme identified under South Africa's NCCRP and could therefore be argued to be aligned with the country's approach to addressing climate change.
National Climate Change Response Strategy for South Africa, 2004	The need for a national climate change policy for South Africa was identified as an urgent requirement during the preparations for the ratification of the UNFCCC in 1997. A process to develop such a policy was thus instituted under the auspices of the National Committee for Climate Change (NCCC), a non-statutory stakeholder body set up in 1994 to advise the Minister on climate change issues and chaired by the then Department of Environmental Affairs and Tourism (DEAT). It was determined that a national climate change response strategy will promote integration between the programmes of the various government departments involved to maximise the benefits to the country as a whole, while minimising negative impacts. Further, as climate change response actions can potentially act as a significant factor in boosting sustainable economic and social development, a national strategy specifically designed to bring this about is clearly in the national interest, supporting the major objectives of the government, including poverty alleviation and the creation of jobs. A number of principles and factors guided the conception of the strategy and are required to be implemented. These are: » Ensuring that the strategy is consistent with national priorities, including poverty alleviation, access to basic amenities including infrastructure development, job

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	creation, rural development, foreign investment, human resource development and improved health, leading to sustainable economic growth. » Ensuring alignment with the need to consistently use locally available resources. » Ensuring compliance with international obligations. » Recognizing that climate change is a cross cutting issue that demands integration across the work programmes of other departments and stakeholders, and across many sectors of industry, business, and the community. » Focussing on those areas that promote sustainable development. » Promoting programmes that will build capacity, raise awareness, and improve education in climate change issues. » Encouraging programmes that will harness existing national technological competencies. » Reviewing the strategy constantly in the light of national priorities and international trends. » Recognizing that South Africa's emissions will continue to increase as development is realised. The strategy was devised through an integrated approach and considers policies and programmes of other government departments and the fact that South Africa is a developing country. This will ensure that the principles of sustainable development are adequately served and do not conflict with existing development policies.
National Biodiversity Economy Strategy (NBES) (March 2016)	The biodiversity economy of South Africa encompasses the businesses and economic activities that either directly depend on biodiversity for their core business or that contribute to conservation of biodiversity through their activities. The commercial wildlife and the bioprospecting industries of South Africa provide cornerstones for the biodiversity economy and are the focus of this strategy. Both the wildlife and bioprospecting sub-sectors of the biodiversity economy have already demonstrated the potential for significant future development and growth. In the study commissioned on the situational analysis of the biodiversity economy, the contribution of the biodiversity economy to the national economy can be measured in terms of Gross Domestic Product (GDP), with the wildlife and bioprospecting industries contributing approximately R3 billion to GDP in 2013. Growth in the wildlife and bioprospecting industries can make a significant impact on the national economy, while contributing to national imperatives such as job creation, rural development and conservation of our natural resources. The Wildlife Industry value chain is centred on game and wildlife farming/ranching activities that relate to the stocking, trading, breeding, and hunting of game, and all the services and goods required to support this value chain. The key drivers of this value chain include domestic hunters, international hunters and a growing retail market demand for wildlife products such as game meat and taxidermy products. This sector is therefore characterised by an interesting combination of agriculture, eco-tourism and conservation characteristics. Over the period 2008-2013, the total Wildlife Industry market grew by more than 14% per year. This growth comprised an average annual growth exceeding 6% in domestic hunting, a decrease in international hunting, and an exponential growth in

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	live auction sales. It is considered likely that the consolidated Wildlife Industry has the potential to experience a weighted average annual growth rate of between 4 %-14 % per year up to 2030. In order for the wildlife and bioprospecting sub-sectors of the biodiversity economy to achieve its full potential, a strategic partnership between the state, private sector and communities is required. To this end, a National Biodiversity Economy Strategy (NBES) is required to guide the sustainable growth of the wildlife and bioprospecting industries and to provide a basis for addressing constraints to growth, ensuring sustainability, identifying clear stakeholder's responsibilities and monitoring progress of the Enabling Actions. The Vision of NBES is to optimise the total economic benefits of the wildlife and bioprospecting industries through its sustainable use, in line with the Vision of the Department of Environmental Affairs. The purpose of NBES is to provide a 14-year national coordination, leadership and guidance to the development and growth of the biodiversity economy. NBES has set an industry growth goal stating that by 2030, the South African biodiversity economy will achieve an average annualised GDP growth rate of 10% per annum. This envisioned growth curve extends into the year 2030 and is aligned to the efforts of the country's National Development Plan, Vision 2030. The NBES seeks to contribute to the transformation of the biodiversity economy in South Africa through inclusive economic opportunities, reflected by a sector which is equitable - equitable access to resources, equitable and fair processes and procedures and equitable in distribution of resources (i.e., business, human, financial, indigenous species, land, water) in the market. To address these transformation NBES imperatives, NBES has the principles of: » Conservation of biodiversity and ecological infrastructure » Sustainable use of indigenous resources » Fair and equitable beneficiation » Socio-economic sustainability » Incentive driven compliance to regulation » Ethical practices » Improving quality and standards of products. The NBES provides the opportunity to redistribute South Africa's indigenous biological/ genetic resources in an equitable manner, across various income categories and settlement areas of the country. The NBES has prioritised nodes in the country for biodiversity economy transformation (BET), referred to as BET nodes. NBES prioritises 18 BET nodes, 13 rural and 5 urban districts across the nine provinces of the country, with communities having been prioritised for development of small and medium size enterprises and community-based initiatives which sustainably use of indigenous biological and/or genetic resources. The municipalities within which the Project is proposed is not identified as a priority area.

Relevant legislation or policy	Relevance to the Buffelspoort Solar PV Energy Facility
	

3.5 Provincial Policy and Planning Context

A brief review of the most relevant provincial policies is provided below in **Table 4.3**. The proposed Project is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 4.3: Provincial legislation and policies relevant to the Project

Relevant legislation or policy	Relevance to Buffelspoort Solar PV Energy Facility
North West Provincial Development Plan (PDP), 2013 (updated 2017/2022)	The North West Provincial Development Plan (PDP) 2013 (updated 2017/2022) states that the overarching objective of the Province is to overcome certain obstacles relating to the current infrastructure by introducing renewable energy, together with energy conservation and efficiency strategies. Furthermore, this will craft a better tomorrow and ensure that underdevelopment, poverty, and inequality is fully addressed in the North West Province. The overall energy objective for the Province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the Province through appropriate financial and fiscal instruments.
North West Province Spatial Development Framework (SDF) (2016) – Published 2017	The Spatial Development Framework (SDF) addresses the need for spatial planning, socio-economic development, infrastructure, and conservation of natural resources. Key socio-economic issues which would require strategic planning provision include employment (including youth and women); poverty eradication;

Relevant legislation or policy	Relevance to Buffelspoort Solar PV Energy Facility
	attracting investment; economic growth; HIV / AIDS and other diseases; food security; physical infrastructure (including availability of industrial land); illiteracy; tourism development; population growth, urbanization, and migration. Natural resource issues include inadequate water resources for future development; bush encroachment and alien invasive species; land and soil degradation; and overgrazing. With regard to spatial planning, the legacies of the Apartheid-era policy are identified as a key issue and residents of the North West Province are consequently extremely underdeveloped. As per the North West Provincial Spatial Development Framework (PSDF) (2017), electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%). According to the North West PSDF, the proposed Project site is located within the Mahikeng Distribution Area, which is characterised by minor developments, including Commercial, Industrial, and Major Electrification; and has a projected growth of 125MW (Eskom, 2015). Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10-year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400 kV power lines and transformation to support or relieve the existing networks. Five (5) transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements. The development of the proposed Project will contribute to economic growth and development, which will in turn help eradicate poverty through job creation and skills development in the region which will be in line with the North West PSDF.
Renewable Energy Strategy for the North West Province (2012)	In 2012, the North West Province's then Department of Economic Development, Environment, Conservation and Tourism (DEDECT) developed the Renewable Energy Strategy for the North West Province. The strategy was developed in response to the need of the North West Province to participate meaningfully within South Africa's renewable energy sector. The Renewable Energy Strategy aims to improve the North West Province's environment, reduce its contribution to climate change, and alleviate energy poverty, while promoting economic development and job creation whilst developing its green economy. According to the strategy, the North West Province consumes approximately 12% of South Africa's available electricity and is rated as the country's fourth largest electricity consuming province. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector, with approximately 63% of the electricity supplied to the Province being consumed in its mining sector. While the strategy recognises that South Africa has an abundance of renewable energy resources available, it is cognisant of the fact that the applicability of these renewable energy resources depends on a number of factors, and as a result are not equally viable for the North West Province. The renewable energy sources that were identified to hold the most potential and a competitive strength for the North West Province are Solar Energy (photovoltaic as well as solar water heaters),

Relevant legislation or policy	Relevance to Buffelspoort Solar PV Energy Facility
	Municipal Solid Waste, hydrogen and fuel cell technologies, biomass, and energy efficiency. The advantages and benefits for the North West Province associated with the implementation and use of renewable energy technologies include: » Provision of energy for rural communities, schools and clinics that are far from the national electricity grid. » Creation of an environment where access to electricity provides rural communities with the opportunity to create an economic base via agricultural and home-based industries and Small, Medium and Micro Enterprises (SMMEs) in order to grow their income-generating potential. » The supply of water within rural communities. » It would result in less time taken for the collection of wood and water, thus improving the quality of life within communities and specifically for women. » Improved health through the reduced use of fuelwood as energy source for cooking and heating that causes respiratory and other hazards. » Solar water heating for households in urban and rural settings, reducing the need for either electricity (in urban settings) and fuelwood (in rural settings) to heat water, thus lowering our National peak demand and conservation of woodlands in a sustainable manner. » Large-scale utilisation of renewable energy will also reduce the emissions of carbon dioxide, thus contributing to an improved environment. » The fact that RE go hand-in-hand with energy efficiency, it will result in additional financial benefit and the need for smaller renewable energy systems. » The development of a strong localised renewable energy industry within the North West Province holds substantial potential for Black Economic Empowerment (BEE) and job creation within the Province. » The establishment of a strong renewable energy base in the North West Province, especially in the manufacturing of fuel cells could stimulate the market for Platinum Group Metals (PGM), which would in turn help the local mining sector. This is due to renewable energy sources having considerable potential for increasing security of supply by diversifying the energy supply portfolio and contributing towards a long-term sustainable energy future. In terms of environmental impacts, renewable energy results in the emission of less GHGs than fossil fuels, as well as fewer airborne particulates, and other pollutants. Furthermore, renewable energy generation technologies save on water consumption in comparison with coal-fired power plants.
North West Environmental Implementation plan (EIP)	The EIP describes Departmental policies, plans, and programmes that may impact on the environment and how these will comply with NEMA principles and national environmental norms and standards, with the aim of ensuring that government integrates environmental considerations into its core mandate, functions, and activities. Many of the activities undertaken by government departments, at the national, provincial, district and local level, have impacts on the environment. The EIP aims to co-ordinate and harmonize the environmental policies, plans, programmes and decisions of the various departments that exercise functions that may affect the environment or are entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment and of provincial and local spheres of government, in order to minimize the duplication of

Relevant legislation or policy	Relevance to Buffelspoort Solar PV Energy Facility
	procedures and functions; and to promote consistency in the exercise of functions that may affect the environment. The Province has championed and been in the forefront at national landscape with regard to promoting integrated planning and co-operative governance. Implementation of this plan will also help government to realize the objectives of the "Setsokotsane" which is an all-inclusive radical interventionist program by the Premier of North West, working together with all MEC's and people in the province to respond to the triple challenges of poverty, unemployment, and inequality.

3.6 Local Policy and Planning Context

The local tiers of government relevant to Project are the Rustenburg Local Municipality and the Bojanala Platinum District Municipality. Instruments and/or policies at both the district and local level contain objectives which align with the proposed Project. These include, economic growth, job creation, community upliftment and poverty alleviation.

Table 4.3: Relevant district and local legislation and policies for Project

Relevant policy	Relevance to Buffelspoort Solar PV Energy facility
Bojanala Platinum District Municipality Climate Changes Response Plan (2016)	Bojanala Platinum District Municipality acknowledges that climate change poses a threat to the environment, its residents, and future development. Actions are required to reduce carbon emissions (mitigation) and prepare for the changes that are projected to take place (adaptation) in the district. Bojanala Platinum District Municipality has therefore prioritised the development of a Climate Change Vulnerability Assessment and Climate Change Response Plan. The plan was developed through the Local Government Climate Change Support (LGCCS) program, with support from the DFFE and the Deutsche Gesellschaft für Internationale (GIZ). Through this program, key climate change vulnerability indicators were identified. These are indicators where Bojanala Platinum District Municipality may be at risk to the impacts of climate change.
Rustenburg Municipality Spatial Development Framework (SDF) - Draft (2018).	The Draft SDF (2018) notes that the development of the of the urban landscape has also been driven by the development of the municipality's mobility routes linking the North West province with Gauteng province. Development within the municipality has grown along the N4 transit corridor. The development of the mining industry within the municipality has also played a key role in terms of the evolution of the spatial development patterns. In this regard the development of Rustenburg over the past 20 – 25 years is closely linked with the development of platinum mining in the region. The Rustenburg Local Municipality benefitted significantly from the increase in platinum output between 1994 and 2009, which grew by 67%. This resulted in Rustenburg having the third fastest growing economy of metropolitan cities in South Africa prior to 2012, outperformed only by Johannesburg and Ekurhuleni. Section 4, spatial proposals, outlines the land use proposals for the Rustenburg Local Municipality. Mining related land uses are of relevance to the proposed Project. The SDF notes that mining in the Rustenburg Local Municipality predominantly occurs in a belt which runs north of and parallel to the Magaliesberg and extends from Pilanesberg in the north, past Rustenburg towards Marikana. These mining activities are not only the corner stone of the local economy of Rustenburg, but also largely within the North West Province. The SDF notes that it is important that the necessary infrastructure is created and maintained to ensure the continued optimal operation of these mining activities. This would include

Relevant policy	Relevance to Buffelspoort Solar PV Energy facility
	energy related infrastructure, such as the proposed Project. The SDF also notes that mining activities and infrastructure can have a significant impact on the current and future spatial structure of the urban area through the physical constraints it poses. These negative potential interactions between the mining activities and proposed future urban development should therefore be minimised as far as possible.
Rustenburg Municipality Integrated Development Plan (IDP) (2021/22	The vision for the Rustenburg Local Municipality (RLM) is "A world class city where all communities enjoy a high quality of life and diversity". The mission statement associated with the vision is "To continuously improve the quality of life. Economic growth and eradicate poverty through best practice, sustainability and inclusive governance". The IDP lists seven strategic priorities, namely: » Ensure a sustainable municipal financial viability and management. » Efficient provision of quality basic services and Infrastructure within a well-planned spatial structure. » Drive diversified economic growth and job creation. » Maintain, a clean, green, safe, and healthy environment for all. » Transform and maintain vibrant and sustainable rural development. » Uphold good governance and public participation principles. » Drive optimal municipal institutional development, transformation, and capacity building. Diversified growth, job creation and the promotion of clean and green environment are of specific relevance to the proposed development. The strategic priorities are underpinned by eleven municipal goals, of which the following are relevant to the proposed development: » Goal 3: A well designed, habitable, clean, and green city » Goal 5: A new post mining world city. » Goal 6: A smart prosperous city. » Goal 7: A vibrant, creative, and innovative city. » Goal 11: City of sustainable and efficient resource management. The IDP also identifies five strategic local economic development goals. The following are relevant to the proposed development: » An enabling and conducive business environment to enhance RLM competitiveness as a destination of choice for tourism, investment, and trade. » Accelerated and shared economic growth through skills development and enterprise development to promote an entrepreneurial culture that will contribute towards improving the livelihoods of the RLM communities. Section 3.3.4.3, Greenhouse gasses and climate change, refers to the risks posed to the RLM by climate change. The initiatives identified to address the risks that are relevant to the development include: » Decarbonization of Electricity –transition from coal powered electricity to renewable energy. » Decarbonisation of Economy-transition to Green Economy projects (LED). A Strength, Weakness, Opportunity, and Threat (SWOT) analysis was undertaken as part of the IDP process. The following are relevant:

Relevant policy	Relevance to Buffelspoort Solar PV Energy facility
	Strengths » Mining Town ***Weaknesses*** » Limited access to strategically located land » **High rate of losses in water and electricity** ***Opportunities*** » **Opportunities for green energy/alternative sources** » Municipality strategically located along the N4 corridor » Potential for agricultural, tourism and mining related sectors. ***Threats*** » Declining mining economy » **Ageing and failing Infrastructure.** » Low levels of skills and education. » High dependency rate (Growing indigent register) » Undiversified economy » High unemployment rate » Low level of household income » Influx of migrant workers » Vandalism and theft from infrastructure network

1.6 4.7 Conclusion

As is evident from the detail within this chapter, the proposed Project is supported by and aligned with national, provincial and local policies and plans.

CHAPTER 4: NEED AND DESIRABILITY

Appendix 3 of the 2014 EIA Regulations (GNR 326) requires that an EIA Report includes a motivation for the need and desirability of the proposed Project, including the need and desirability of the activity in the context of the preferred location. The need and desirability of the proposed Project needs to consider whether it is the right time and the right place for locating the type of land-use/activity being proposed. The need and desirability of a proposed development is, therefore, associated with the wise use of land, and should be able to respond to the question such as, but not limited to, what the most sustainable use of the land may be.

This Chapter provides an overview of the suitability of the Buffelspoort Solar PV Energy Facility being developed at the preferred project location considering international, national and local policy as well as the receptiveness of the proposed site for the project. It provides an overview of the need and desirability, and perceived benefits of the Project specifically.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 3: Scope of Assessment and Content of the Environmental Impact Assessment Report:

Requirement	Relevant Section
3(1)(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report.	The need and desirability for the development Buffelspoort Solar PV Energy Facility is included and discussed within **Section 4.2.**

4.2. Need and Desirability of the Buffelspoort Solar PV Energy Facility

South Africa has experienced 15 years of intermittent black-outs and in the recent months, the country has yet again faced a considerable shortage in the availability and stability of electricity supply. This has taken its toll on industries that are electricity intensive and has prompted these industries to consider not only the diversification of their energy mix, but also to change their reliance on State-provided electricity.

In 2021, the South African government acknowledged that aging state-owned electricity infrastructure and a demand far surpassing supply, is hampering the country and economy's growth. On 10 June 2021, President Ramaphosa announced the government's approval of an increase in the generation license exemption threshold for embedded generation facilities from 1 MW to 100 MW. This allows industry to not only generate electricity for self-consumption but allows them to develop facilities with a more realistic capacity response to their demand requirements without the need to obtain a Generation License from NERSA. This in turn aims to reduce generation demands on the national grid and to alleviate residential, commercial, and industrial electricity supply constraints. In July 2022, the President indicated that the South African Government has developed a set of actions to respond to the energy crisis. These actions will allow

for accelerated new electricity generation capacity while protecting the rights of all South Africans and upholding the rule of law.

The need for alternative renewable sources of energy has become very apparent, in the local and international context. South Africa is fast becoming an integral part of this global transition towards using renewable sources for electricity generation. This evolution has been largely prompted by South Africa's carbon footprint, considering that South Africa is the largest emitter of greenhouse gases in Africa, accounting for as much as 42 % of the continent's total emissions. South Africa is furthermore estimated to rank amongst the top 20 largest emitters of greenhouse gases in the world. The South African economy is a very energy-intensive economy with a high dependence on coal-based electricity generation. Considering this and the impact the country has, the South African government committed to supplementing the existing generation capacity of thermal and nuclear power plants with renewable energy power generation. This has created a framework and a more conducive environment for industry to steadily incorporate alternative renewable energy sources as part of their energy mix.

In addition to a more stabilized supply, renewable energy facilities also have numerous environmental, social and economic benefits, which align with the private off-taker's sustainability efforts. In line with South Africa's approach of moving towards more sustainable green economy and reducing its carbon footprint on the world, the off-taker has also set goals in order to contribute to meeting these global carbon reduction targets They have illustrated their committed to reducing their carbon emissions by 30% by 2030 (from a 2020 financial year baseline that uses 2019 data). In addition to this goal, the off-taker is currently developing a roadmap to be net carbon neutral by 2050 (decarbonisation targets) (Bell, 2019).

The purpose of the proposed Project is thus to enable the off-taker to diversify their energy mix and to reduce their reliance on Eskom supplied power and is a conscious effort for the off-taker to contribute to their sustainability targets and reduce their carbon footprint.

Lastly, when assessing the regional context of the proposed Project it is clear that the North West Province provincial development plan aims to align the vision, objectives and priorities of the Province with that of the broader South Africa. The Province has chosen twelve (12) Provincial Priority Areas with which it aims to align to the NDP. Priority Area 2, Economic Infrastructure, highlights the Province's need to expand renewable energy with special reference to solar power.

Considering the South African initiatives implemented on a national, provincial and regional level, it can be concluded that the proposed Project does align with the national energy planning efforts, with renewable energy having links to climate change, environmental impact and electricity supply security, stability and flexibility considerations. In addition to this, the concept of a solar energy project is broadly supported in local economic planning documents. Considering the development planning initiatives, goals and objectives of the North West Province, the district and the Rustenburg Local Municipality, it can be concluded that the concept of the proposed Project is broadly supported. Lastly, when reviewing the environmental and social benefits that a project of this nature has there is a clear alignment with not only South African sustainability initiatives but also that of the off-taker.

4.2.2 Receptiveness of and desirability of the site to the development of the Buffelspoort Solar PV Energy Facility

The placement of a Solar PV Energy Facility is strongly dependent on several factors, including climatic conditions (solar resource), topography, the location of the site, land availability and suitability, and the extent of the site. From a local level perspective, the site has specifically been identified by the Project Developer as being highly desirable from a technical perspective for the development of a Solar PV Energy Facility due to the following site characteristics:

» **Solar resource:** The Project Developer has selected Solar PV technology for its facility, due to the fact that South Africa has some of the highest levels of solar radiation in the world, with an average daily solar radiation that varies between 4.5 kilowatt hours per square metre per day (kWh/m^2/day) and 6.5 kilowatt hours per square metre per day (kWh/m^2/day). This, in comparison to about 3.6 kWh/m^2/day for parts of the United States and about 2.5 kWh/m^2/day for Europe and the United Kingdom, reveals that South Africa has considerable solar resource potential which should be exploited. The Global Horizon Irradiation (GHI) for the study area is in the region of 2 000 – 2 120 kWh/m^2/annum, which is considered feasible for the development of a Solar PV Energy Facility.

» **Proximity to the private off-taker and point of interconnection:** The Development Area is located in close proximity to the private off-taker, and is therefore preferred for development of the proposed Solar PV Energy Facility. Furthermore, there is an existing available 88kV substation situated north of the Development Area that is considered a feasible grid connection point in order enable the evacuation of the generated power from the Solar PV Energy Facility to the private off-taker.

» **Geographical and Topographical Consideration:** The terrain elevation within the Study Area[13] ranges from approximately 1 140 m above sea level in the north and 1 560 m to the south at the top of the mountains. These mountains are the northern foothills of the Magaliesberg Mountains, located further south of the project site. The Development Area is predominantly characterised by a slope percentage between 0 and 10% with some irregularities in areas with slopes reaching 45%. This indicates a non-uniform topography with occurrence of some steep sloping areas being present. These areas within a slope percentage between 0 and 10% are feasible for the development of a PV facility. Sites that facilitate easy construction conditions (i.e., relatively flat topography, lack of major rock outcrops etc.) are favoured during the site selection process for a Solar PV Energy Facility, and the proposed development area fits this criterion.

» **Land Availability and Suitability** – In order to develop the Project with a contracted capacity of up to 40 MWp, sufficient space is required. The properties included in the Project Site were identified considering the feasible solar resource and are deemed technically feasible by the Project Developer for such development to take place. The Project Site was determined to be available for development of the Solar PV Energy Facility through agreement with the landowner. The properties that make up the Project Site are privately-owned properties and are up to ~223 ha in extent, which was considered by the Project Developer as sufficient for the development of the Solar PV Energy Facility and associated grid connection infrastructure. The Overhead Line traverses the N4 Bakwena National Road on Portion 121 of Farm Buffelspoort 343 JQ). A Development Area of ~77 ha has been demarcated within this larger Project Site for the location of the facility. A facility layout showing the placement of infrastructure within

[13] The Study Area is the broader geographic area within which the Project is proposed

the Development Footprint (approximately 57 ha in extent) will be designed considering the sensitivities or constraints identified as part of the Scoping Phase and assessed as part of the EIA Phase.

The Study Area is currently primarily used for mining purposes and the Development Area is being used as a leisure game farm by the off-taker. The development of the Solar PV Energy Facility on these properties will ensure the continuation of an economically viable land use.

» **Site access**: The Project Site is bordered to the north by the N4, to the south by the R104 (Old Rustenburg Road) and to the west by Marikana Road. The Project Site is therefore easily accessible for both construction and operation.

» **Proximity *to Towns with a Need for Socio-Economic Upliftment:*** The proposed Project is located within the Rustenburg Local municipality falling under the Bojanala Platinum District Municipality and near the town of Mooinooi. As per the Integrated Development Planning detailed in Section 4.6, the local and district municipalities experience high levels of unemployment, poverty, and inequality mainly amongst the youth, women, and people with disabilities. With the development of the Project, secondary social benefits can be expected in terms of additional spend in the nearby towns due to the increased demand for goods and services. Considering the above, it is clear that a need for employment opportunities and skills development is present within the area.

Taking into consideration the solar resource, proximity to the off-taker and point of interconnection, land availability and suitability, geographical and topographical location, access to road infrastructure and proximity to towns with a need for socio-economic upliftment, the development of the Project within the Development Footprint is considered to be desirable. The Development Footprint within which the facility is proposed is sufficient in extent for the installation of a solar PV facility, while allowing for the avoidance of environmental site sensitivities. Similarly, the power line corridor identified is sufficient for the placement of the power line while allowing for the avoidance of environmental sensitivities. This consideration is in line with the mitigation strategy and enables the achievement of the objectives of the mitigation hierarchy (i.e., avoid, minimise, mitigate). This application of the mitigation strategy allows for the identification of the optimised placement of the PV facility within the Development Area. This approach will ensure that the final location of the PV facility and associated infrastructure is desirable from an environmental and social perspective.

4.3 Benefits of Renewable Energy and the Need and Desirability in the South African Context

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits include:

Socio-economic upliftment of local communities: The Project has the potential to create much needed employment for unskilled locals during the construction phase. Where possible, training opportunities will also be afforded to qualified local people who can be upskilled to undertake certain roles during the construction and operation phases. Some of the challenges facing the Local and District municipalities, as detailed in the IDPs include high rates of unemployment and high levels of poverty. The Local and District municipalities are therefore in need of economic development, sustainable employment opportunities and growth in personal income levels. A study undertaken by the DMRE, National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of renewable energy projects implemented to date had created 40% more jobs for

South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.

Resource saving: It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free, while compared to the continual purchase of fuel for conventional power stations.

Exploitation of significant renewable energy resource: At present, valuable renewable resources, including biomass by-products, solar irradiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.

Economics: As a result of the excellent resource and competitive procurement processes, both wind power and solar PV power are now proven in South Africa as cheaper forms of energy generation than coal power. They offer excellent value for money to the economy and citizens of South Africa while benefitting society as a whole through the development of clean energy.

Pollution reduction: The release of by-products through the burning of fossil fuels for electricity generation has a particularly hazardous impact on human health and contributes to ecosystem degradation. The use of solar irradiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation.

Climate friendly development: The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. South Africa is estimated to currently be responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. The development of Buffelspoort Solar PV Energy Facility and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO_2 emissions.

Support for international agreements: The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol and the Paris Agreement, and for cementing its status as a leading player within the international community.

Employment creation: The development, procurement, installation, maintenance and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The construction phase will create temporary employment opportunities and the operation phase will create limited full-time employment opportunities.

Acceptability to society: Renewable energy offers a number of tangible benefits to society, including reduced pollution concerns, improved human and ecosystem health and climate friendly development.

Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities which have potential for further renewable energy projects.

Protecting the natural foundations of life for future generations: Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development.

CHAPTER 5: APPROACH TO UNDERTAKING THE EIA PHASE

In terms of the EIA Regulations of December 2014 (as amended) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of the Project is a listed activity requiring Environmental Authorisation (EA). The application for EA is required to be supported by an Environmental Impact Assessment (EIA) (S&EIA) process based on the contracted capacity of the facility being up to 40 MWp and Activity 1 of Listing Notice 2 (GNR 325) being triggered.

An EIA process refers to the process undertaken in accordance with the requirements of the relevant EIA Regulations (the 2014 EIA Regulations (GNR 326), as amended), which involves the identification and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed Project or activity. The EIA process comprises two main phases: i.e., **Scoping** and **EIA Phase.**

This chapter outlines the process that was followed during the Scoping & EIA process. The EIA process is illustrated in **Figure 5.1**.

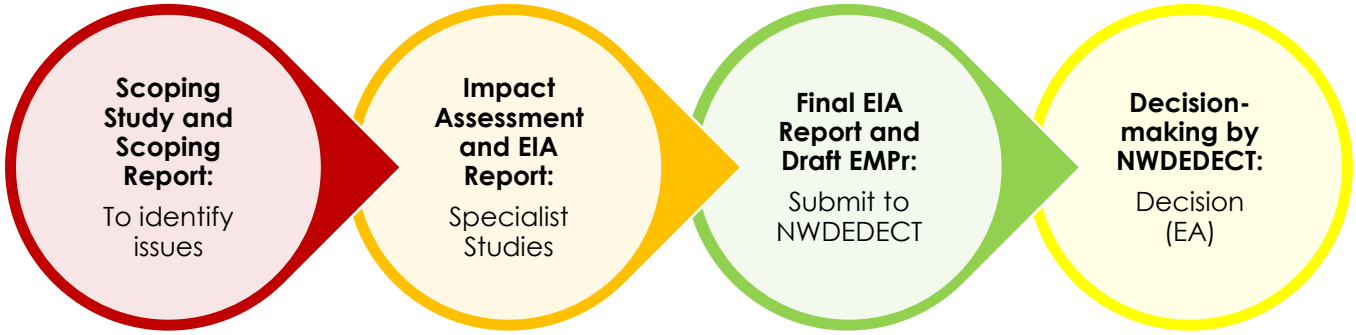


Figure 5.1: The Phases of an Environmental Impact Assessment (EIA) Process

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 3: Scope of Assessment and Content of the Environmental Impact Assessment Report

Requirement	Relevant Section
3(c) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for and (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	All listed activities triggered and applied for are included in **Section 5.2**.
3 (g)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The public participation process followed throughout the S&EIA process of the Project is included in **Section 5.5.2** and copies of the supporting documents and inputs are included in **Appendix C**.
3 (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	The main issues raised through the undertaking of the public participation process, including consultation with I&APs, are included in the Comments and Responses Report in **Appendix C8**.
3(g)(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives is included in **Section 5.6.1**.

5.2 Relevant legislative permitting requirements

The legislative permitting requirements applicable to Project, as identified at this stage in the process and considered within this S&EIA process, are described in more detail under the respective sub-headings. Additional permitting requirements applicable to the project are detailed within **Section 5.6**.

5.2.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA (No. 107 of 1998) is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (CA) (the decision-maker) charged by NEMA with granting of the relevant EA. According to the Explanatory Document for Government Notice No. 779 published in Government Gazette No. 40110 dated 01 July 2016, if the project developer will not, or does not, intend to participate in any of the Integrated Resource Plan programmes (IRP), the competent authority (CA) will be the Member of the Executive Council (MEC) responsible for environmental affairs in the respective province, unless another sub-section of section 24C of NEMA specifies the Minister to be the CA. Since the purpose of the Project is to generate power for use by a private off-taker, and since the Project will not be bid into the REIPPPP or a similar government programme, the NWDEDECT has been determined as the CA.

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that developers are provided the opportunity to consider the potential environmental impacts of their activities early in the Project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the CA with sufficient information in order for an informed decision to be taken regarding the Application for EA.

The EIA process being conducted for the Project is being undertaken in accordance with Section 24(5) of the NEMA, which defines the procedure to be followed in applying for EA, and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the CA. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the CA subject to the completion of an EIA (either a Basic Assessment (BA) or full S&EIA).

Table 5.1 details the listed activities in terms of the EIA Regulations, 2014 (as amended) that apply to the Project, and for which an application for EA has been submitted to the NWDEDECT. The table also includes a description of the specific project activities that relate to the applicable listed activities.

Table 5.1: Listed activities identified in terms of the Listing Notices (GNR 327, 325 and 324).

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity – (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275kV or more. ***Internal electrical infrastructure required to connect the PV facility to the existing 88kV substation will consist of an 88kV onsite substation and an 88kV single-circuit overhead power line.***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	12(ii)(a)(c)	The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more Where such development occurs- (a) within a watercourse; or (c) within 32 metres of a watercourse. ***Wetlands have been identified within the development area and grid connection corridor. The construction of the Solar PV Energy Facility and associated infrastructure will therefore occur within the wetlands as well as within 32m of the wetlands. The Solar PV Energy Facility will have a physical footprint exceeding 100m^2, and pylon placement could occur within 32m of these wetlands.***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	***19 (ii)***	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 cubic meters from a (i)watercourse.

Notice Number	Activity Number	Description of listed activity
		Wetlands have been identified within the development area and grid connection corridor. The construction of the Solar PV Energy Facility and associated grid connection infrastructure could require the infilling and removal of approximately 10 cubic metres of soil and rock from the wetlands.
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	28 (ii)	Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare. ***The Solar PV Energy Facility will have a physical footprint exceeding 1ha and occurs outside an urban area and within an area currently zoned for agriculture.***
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, ***The Solar PV Energy Facility will generate electricity from a renewable resource (i.e., solar) and will have a generating capacity of up to 40MWp.***
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	15	The clearance of an area of 20ha or more of indigenous vegetation[14]. ***The Solar PV Energy Facility will result in the clearance of indigenous vegetation within an area in excess of 20ha for the development infrastructure.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended	4(h)(iii)(iv)	The development of a road wider than 4 metres with a reserve less than 13,5 metres. h. North West iii. Sites or areas identified in terms of an international convention. iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. ***During construction, a permanent access road along the length of the power line corridor between 4 - 8m wide will be established to allow for large crane movement. This track will then be utilised for maintenance during operation. The Development Footprint and grid connection corridor overlap with a Critical Biodiversity Area (CBA2) and with the Magaliesberg Biosphere Reserve, which is a United Nations Educational, Scientific and Cultural Organization (UNESCO) site. The Development Footprint encroaches into areas designated as a Buffer Zone whereas the grid corridor extends into the Transition Area.***

[14] "Indigenous vegetation" as defined by the 2014 EIA Regulations (GNR 326) refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

Notice Number	Activity Number	Description of listed activity
Listing Notice 3 (GNR 324) 08 December 2014 (as amended	10(h)(i)(iv)(vi)	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres h. North West i. World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an international convention. iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland. ***The development of the Project will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the onsite substation where such storage will occur inside containers with a combined capacity of 50 cubic meters during the construction phase and 5 cubic metres during the operational phase. The Development Footprint and grid connection corridor overlap with a Critical Biodiversity Area (CBA2) and with the Magaliesberg Biosphere Reserve, which is a United Nations Educational, Scientific and Cultural Organization (UNESCO) site. The Development Footprint encroaches into areas designated as the Buffer Zone whereas the grid corridor extends into the Transition Area. Wetlands have been identified within the Development Footprint and grid connection corridor.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended	12(h)(i)(iv)(vi)	The clearance of an area of 300 square metres or more of indigenous vegetation h. North West i. World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an international convention. iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority. vi. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland. ***The Project will have a physical footprint of exceeding 300m^2. The Development Footprint and grid connection corridor overlap with a Critical Biodiversity Area (CBA2) and with the Magaliesberg Biosphere Reserve, which is a United Nations Educational, Scientific and Cultural Organization (UNESCO) site. The Development Footprint encroaches into areas designated as the Buffer Zone whereas the grid corridor extends into the Transition Area. Wetlands have been identified within the Development Footprint and grid connection corridor.***
Listing Notice 3 (GNR 324)	14(ii)(a)(c)(h)(i)(iv)	The development of— (ii) infrastructure or structures with a physical footprint of 10 square meters or more.

Notice Number	Activity Number	Description of listed activity
08 December 2014 (as amended		where such development occurs— (a) within a watercourse. (c) within 32 meters of a watercourse, measured from the edge of a watercourse. h. North West i. World Heritage Sites; core of biosphere reserve; or sites or areas identified in terms of an international convention. iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority. ***The Solar PV Energy Facility will have a physical footprint exceeding 10m². The development area and grid connection corridor overlap with a Critical Biodiversity Area (CBA2) and with the Magaliesberg Biosphere Reserve, which is a United Nations Educational, Scientific and Cultural Organization (UNESCO) site., The development Footprint encroaches into areas designated as the Buffer Zone whereas the grid corridor extends into the Transition Area. Wetlands have been identified within the Development Footprint and grid connection corridor. The construction of the Project and associated infrastructure will therefore occur within the wetlands as well as within 32m of the wetlands, and it is possible that the pylon placement will occur within 32m of these wetlands.***

5.2.2 National Water Act (No. 36 of 1998) (NWA)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be licensed with the CA (i.e., the Regional Department of Water and Sanitation (DWS) or the relevant Catchment Management Agency (CMA)). Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

Table 5.2 contains Water Uses associated with the proposed project and identified in terms of the NWA which require licensing either in the form of a General Authorisation (GA), or in the form of a Water Use License (WUL). The table also includes a description of those project activities which relate to the applicable Water Uses.

Table 5.2: List of Water Uses published under Section 21 of NWA, as amended.

Notice No.	Activity No.	Description of Water Use
NWA (No. 36 of 1998)	Section 21 (a)	Taking water from a water resource. ***Groundwater from existing boreholes may be abstracted for use during the construction and operation phases for the Solar PV Energy Facility.***
NWA (No. 36 of 1998)	Section 21 (b)	Storing water

Notice No.	Activity No.	Description of Water Use
		Abstracted groundwater for use during the construction and operation phases for the Solar PV Energy Facility will be stored on site.
NWA (No. 36 of 1998)	Section 21 (c)	Impeding or diverting the flow of water in a watercourse ***Wetlands have been identified within the Development Footprint and grid connection corridor. Activities pertaining to the establishment of the infrastructure might encroach on the wetlands which may lead to an impediment and diversion of the flow of water in the watercourse.***
NWA (No. 36 of 1998)	Section 21 (i)	Altering the bed, banks course or characteristics of a watercourse ***Wetlands have been identified within the Development Footprint and grid connection corridor. Activities pertaining to the establishment of the infrastructure might alter the bed, banks, course or characteristics of the watercourses.***

The above-mentioned water uses have been confirmed for the Project and therefore a Water Use License Authorisation (WULA) is required. This will need to be in accordance with the requirements of the Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals (GN R267), or a GA registered in accordance with the requirements of Revision of General Authorisation. The Project Developer has commenced with a Water Use License Application in terms of the National Water Act (1998).

5.2.3 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources, and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

Section 38: Heritage Resources Management

1). Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

- *a. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- *b. the construction of a bridge or similar structure exceeding 50m in length;*
- *c. any development or other activity which will change the character of a site –*
  - *i). exceeding 5 000m² in extent; or*
  - *ii). involving three or more existing erven or subdivisions thereof; or*
  - *iii). involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
  - *iv). the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*

Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority (South African Heritage Resources Authority – SAHRA) ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed Project, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the South African Heritage Resources Agency (SAHRA) Permit Regulations (GNR 668).

5.3 Overview of the Scoping and EIA (S&EIA) Process being undertaken for Buffelspoort Solar PV Energy Facility

In terms of NEMA the 2014 EIA Regulations (GNR 326), and the Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325) and Listing Notice 3 (GNR324)), the development of the Project requires EA from NWDEDECT subject to the completion of a full S&EIA, as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326). The need for a full S&EIA process to be conducted in support of the application for EA is based on listed activities triggered which are contained within Listing Notice 2 (GNR 325).

The S&EIA process is to be undertaken in two phases as follows (refer to **Figure 5.2**):

» The **Scoping Phase** includes the identification and description of potential issues associated with the Project through a desktop study and consultation with I&APs and key stakeholders through a Public Participation Process. The entire Development Area is considered within this process. Through this study, areas of sensitivity within the Development Area are identified and delineated in order to identify any environmental fatal flaws, and environmentally sensitive, or no-go areas which need to be considered. In accordance with Regulation 21(1) of the 2014 EIA Regulations (GNR 326), the Scoping Report was prepared for the Project and subject to a 30-day review and comment period during which any Interested and Affected Party (I&AP) or Authority were invited to review and provide comment on the findings. Following the completion of this review period, a Final Scoping Report which incorporated all comments received during the 30-day public review and comment period, was prepared and submitted to NWDEDECT for its consideration. Following its receipt of the Final Scoping Report, NWDEDECT had 43 days within which to either accept the Scoping Report, and advise the project developer to proceed or continue with the tasks contemplated in the Plan of Study for EIA, or refuse the application for EA in the event that the proposed activity is in conflict with a prohibition contained in legislation, or the Scoping Report does not substantially comply with Appendix 2 of the 2014 EIA Regulations (GNR 326). Acceptance of Scoping was received from NWDEDECT on **21 September 2022**.

» The **EIA Phase** involves a detailed assessment of potentially significant positive and negative direct, indirect, and cumulative impacts identified during the Scoping Phase. This phase includes detailed specialist investigations and a Public Participation Process, and results in the compilation of an EIA Report and Environmental Management Programme (EMPr). In accordance with Regulation 23(1)(a) of the 2014 EIA Regulations (GNR 326), the EIA Report and EMPr prepared for the Project will also be subject to a 30-day public review and comment period (**from Friday, 04 November 2022 – Monday, 05 November 2022**) during which members of the public, I&APs, and authorities will be invited to review and provide comment on the EIA Report and EMPr. Following the conclusion of this review period a Final EIA Report and EMPr which incorporates all comments received during the 30-day review and comments period,

will be prepared and submitted to NWDEDECT for its consideration. Following its receipt of the Final EIA Report and EMPr, NWDEDECT has 107 days within which to either grant or refuse the EA.

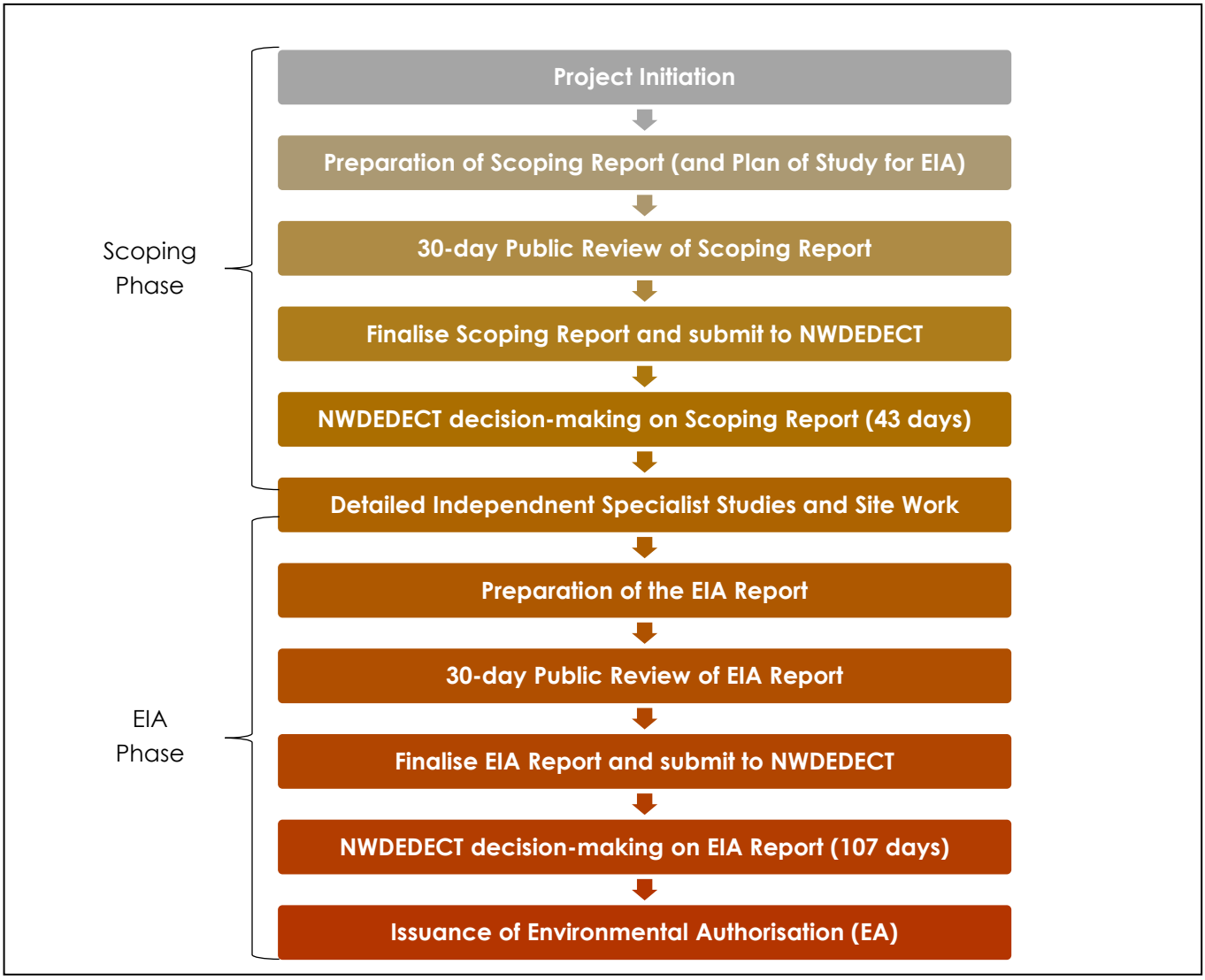


Figure 5.2: Regulated timeframe of a S&EIA Process

5.4 Objectives of the EIA Phase

As per the EIA Regulations (GNR 326) the objectives of the EIA Phase are to, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context.
- Describe the need and desirability of the proposed , including the need and desirability of the activity in the context of the Development Footprint on the approved site as contemplated in the accepted Scoping Report.
- Identify the location of the Development Footprint within the approved site as contemplated in the accepted Scoping Report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified Development Footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment.

- Determine the:
  - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
  - Degree to which these impacts:
    - Can be reversed
    - May cause irreplaceable loss of resources
    - Can be avoided, managed or mitigated
- Identify the most ideal Development Footprint for the activity within the development envelope of the approved site as contemplated in the accepted Scoping Report based on the lowest level of environmental sensitivity identified during the assessment.
- Identify, assess, and rank the impacts the activity will impose on the Development Footprint on the approved site as contemplated in the accepted Scoping Report through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts.
- Identify residual risks that need to be managed and monitored.

This EIA Report assesses potential positive and negative, direct, indirect, and cumulative impacts associated with all phases of the project life cycle including pre-construction, construction, operation and decommissioning. In this regard the EIA Report aims to provide the CA with sufficient information to make an informed decision regarding the proposed Project.

5.5 Overview of the EIA Phase

Key tasks undertaken within the EIA Phase include:

- Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- Undertaking a Public Participation Process in accordance with Chapter 6 of GNR326, and the DFFE (2017) Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed Project.
- Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended, and the requirements of the Specialist Protocols published in Regulation GNR 320, issued 20 March 2020 and GNR 1150 of 30 October 2020, where relevant, as well as other relevant guidelines.
- Preparation of an EIA Report in accordance with the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326).
- Preparation of an EIA Report in accordance with the requirements of Appendix 4 of the 2014 EIA Regulations (GNR 326).
- Preparation of a Comments and Response (C&R) Report detailing all comments raised by I&APs and responses provided as part of the EIA Phase.
- Submission of a Final EIA, including an Environmental Management Programme (EMPr), to NWDEDECT for review and approval.

5.5.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

As the proposed Project is intended for self-generation of electricity from a renewable resource, the NWDEDECT is the CA for the Project. Consultation with this authority is being undertaken throughout the S&EIA process. To date, this consultation has included the following:

- Holding a pre-application meeting with NWDEDECT on **04 May 2022**.
- Submission of the application for EA to the NWDEDECT via hard copy submission on **24 June 2022**.
- Submission of the Scoping Report for review and comment by:
  - The competent and commenting authorities on **24 June 2022**.
  - State departments that administer laws relating to a matter affecting the environment relevant to an application for EA.
  - Organs of State which have jurisdiction in respect of the activity to which the application relates.
- Site Visit with CA on **03 August 2022**.
- Submission of a Final Scoping Report on **03 August 2022**.
- Receipt of acceptance of the Scoping Report and approval of the Plan of Study for the EIA Phase on **21 September 2022**.

A record of all authority correspondence undertaken as part of the S&EIA process to date is included in **Appendix B**.

5.5.2 Public Participation Process

Public participation is an essential and regulatory requirement for an EA process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this proposed Project.

The sharing of information forms the basis of the PPP and offers the opportunity for Interested and Affected Parties (I&Aps) to become actively involved in the S&EIA from the outset. The PPP is designed to provide sufficient and accessible information to I&APs in an objective manner. The PPP affords I&APs opportunities to provide input into and receive information regarding the S&EIA process in the following ways:

- During the **Scoping Phase**:
  - Provide an opportunity to submit comments regarding the Project.
  - Attend Focus Group Meetings to be conducted for the Project.
  - Assist in identifying reasonable and feasible alternatives, where required.
  - Contribute relevant local information and knowledge to the environmental assessment.
  - Allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations.
  - Foster trust and co-operation.
  - Generate a sense of joint responsibility and ownership of the environment.
  - Comment on the findings of the Scoping Phase results.
  - Identify issues of concern and suggestions for enhanced benefits.

- During the **EIA Phase**:
  - Contribute relevant local information and knowledge to the environmental assessment.
  - Verify that issues have been considered in the environmental investigations as far as possible as identified within the Scoping Phase.

- Comment on the findings of the environmental assessments.
- Attend Focus Group Meetings to be conducted for the Project.

» During the **decision-making phase**:
- To advise I&APs of the outcome of the CA's decision, and how and by when the decision can be appealed.

The PPP therefore aims to ensure that:
» Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.
» The information presented during the PPP is presented in such a manner, i.e., local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
» Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the Project.
» A variety of mechanisms are provided to I&APs to correspond and submit their comments i.e., fax, post, email, telephone, text message (SMS and WhatsApp).
» An adequate review period is provided for I&APs to comment on the findings of the Scoping and EIA Reports.

A comprehensive consultation process was designed and implemented for the Project to cater for the undertaking of a full-scale, innovative PPP which included I&APs, the CA, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders, while remaining within the limits as stipulated by the National Government. The following sections detail the tasks undertaken as part of the PPP within the S&EIA process to date.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the CA, which register must contain the names, contact details and addresses of –
    (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
    (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
    (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database and the Project Developer, liaison with potentially affected parties in the greater surrounding area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the Project database. Other stakeholders are required to formally register their interest in the Project through either directly contacting the Savannah Environmental Public Participation team via phone, text message (SMS and WhatsApp), email or fax, or registering their interest via the online stakeholder engagement platform. A list of key stakeholders identified and registered is listed in **Table 5.3**.

Table 5.3: List of Stakeholders identified for the inclusion in the database during the PPP for the Project

Organs of State
National Government Departments
Department Forestry, Fisheries, and the Environment (DFFE)
Department of Mineral Resources and Energy (DMRE)
Department of Agriculture, Land Reform, and Rural Development (DALRRD)
Department of Water and Sanitation (DWS)
Government Bodies and State-Owned Companies
Air Traffic Navigation Services (ATNS)
Co-Operative Governance & Traditional Affairs
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
South African Civil Aviation Authority (CAA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
Telkom SA SOC Limited
Transnet SA SOC Limited
Provincial Government Departments
North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDCT)
North West Department of Public Works and Roads (NWDPWR)
North West Department of Agriculture and Rural Development (NWDARD)
North West Provincial Heritage Resources Agency ((NWPHRA) – provincial Heritage Authority
Local Government
Bonjala Platinum District Municipality
Rustenburg Local Municipality
Commenting Stakeholders
Agri North West (AgriSA)
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Wildlife and Environment Society of South Africa (WESSA)
Magaliesburg Biosphere
Landowners
Affected landowners, tenants, and occupiers
Neighbouring landowners, tenants, and occupiers
Others
Vodacom, Cell C, ATNS, SKA, CAA

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guideline has also been followed. The register of I&APs contains the names[15] of:

» All persons who requested to be registered on the database through the use of the online stakeholder engagement platform or in writing and disclosed their interest in the Project.

[15] Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (No 4 of 2013).

» All Organs of State which hold jurisdiction in respect of the activity to which the application relates.
» All persons who submitted written comments.

I&APs have been encouraged to register their interest in the S&EIA process from the onset of the Project, and the identification and registration of I&APs will be on-going for the duration of the S&EIA process. The database of I&APs will be updated throughout the S&EIA process and will act as a record of all I&APs involved in the PPP.

ii. Advertisements and Notifications

40.(2)(a)	Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of – (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) Any alternative site.
40.(2)(b)	Giving written notice, in any of the manners provided for in section 47Dof the Act, to – (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) The municipality which has jurisdiction in the area; (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) Any other party as required by the competent authority.
40.(2)(c)	Placing an advertisement in – (i) One local newspaper; or (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
40.(2)(d)	Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
40.(2)(e)	Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to – (i) Illiteracy; (ii) Disability; or (iii) Any other disadvantage.

The S&EIA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

» Compilation of a background information document (BID) (refer to **Appendix C3**) providing technical and environmental details on the Project and how to become involved in the S&EIA process. The BID and the initial Project notification letter announced the S&EIA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/I&APs, and inviting I&APs to register on the Project's database were distributed via email on **09 June 2022.** The evidence of

the distribution is contained in **Appendix C** of the EIA Report. The BID is also available electronically on the Savannah Environmental website (http://www.savannahsa.com/public-documents/energy-generation/).

» Placement of site notices announcing the S&EIA process at visible points along the boundary of the affected properties, in accordance with the requirements of the EIA Regulations on **27 May 2022**. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C2** of the Scoping Report.

» Placement of an advertisement announcing the S&EIA process and the availability of the Scoping Report for view by I&APs for a 30-day review and comment period in the Rustenburg Herald Newspaper on **10 June 2022**. A copy of the newspaper advert, as sent to the newspaper and the newspaper advert tear sheet is included in **Appendix C2** of the Scoping Report.

» The Scoping Report was made available for review by I&APs for a 30-day review and comment period from **Tuesday, 14 June 2022 – Friday, 15 July 2022**. The full Scoping Report was made available on the Savannah Environmental website and all registered I&APs were notified of the availability on **14 June 2022** via email which included the link to access the report on the Savannah Environmental website. The evidence of distribution of the Scoping Report is included in the Final Scoping Report submitted to the NWDEDECT for acceptance.

» A public meeting was held with key stakeholders on **Tuesday, 28 June 2022 at 17h00** via a virtual platform.

» Focus group meetings were held with key stakeholders on **Wednesday, 06 July 2022 at 09h00 – 10h30, 11h00 – 12h30, and 14h00 – 15h30** via a virtual platform.

» Notification letter distributed to all registered parties advising them of the availability of the EIA Report for review on comment on **04 November 2022.**

» An advertisement announcing the availability of and inviting comment on the EIA Report in the Rustenburg Herald Newspaper (English advertisement) on **02 November 2022** A copy of the newspaper advert as sent to the newspaper is included an **Appendix C2** of the EIA Report. The advert tear sheet will be included in the final EIA Report as **Appendix C2**.

» The Draft EIA Report is available for review and comment by I&APs for a 30-day period from **04 November 2022** to **05 December 2022** The Draft EIA Report is available on the Savannah Environmental website (https://savannahsa.com/public-documents/energy-generation/). I&APs will be encouraged to review the EIA Report and submit written comment. The EIA Report will be circulated to Organs of State via electronic transfer (Dropbox, WeTransfer, etc), or CD and/or hardcopy as per individual request. Evidence of distribution of the EIA Report will be included in the final EIA Report as **Appendix C4** and **Appendix C5**.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the surrounding area, as well as capture their views, comments, issues and concerns regarding the Project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

Table 5.4: Public involvement for the Project

Activity	Date
Distribution of the BID, process notification letter and stakeholder reply form announcing the EIA process and inviting I&APs to register on the Project database.	09 June 2022

Activity	Date
The BID and electronic reply form was also made available on the online stakeholder engagement platform.	
Placement of site notices at the within the affected properties	27 May 2022
Placement of an advertisement in the Rustenburg Herald announcing the S&EIA process and the availability of the EIA Report for a 30-day review and comment period, including details on how to access the Scoping Report via the online stakeholder engagement platform.	10 June 2022
Distribution of notification letters announcing the availability of the Scoping Report for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the surrounding area (including neighbouring landowners) and key stakeholder groups.	14 June 2022
30-day review and comment period of the Scoping Report.	Tuesday, 14 June 2022 – Friday, 15 July 2022
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: » Landowners. » Authorities and key stakeholders (including Organs of State, local municipality and official representatives of community-based organisations). » Where an I&AP does not have access to a computer and/or internet to participate in a virtual meeting telephonic discussions (including WhatsApp video call) will be set-up and minuted for inclusion. The preferred language of the I&AP has been considered when setting up these discussions. » Direct in-person consultation will only take place in limited numbers and where sanitary conditions can be maintained at all times.	» A public meeting was held with key stakeholders on **Tuesday, 28 June 2022 at 17h00** via a virtual platform. » Focus group meetings were held with key stakeholders on **Wednesday, 06 July 2022 at 09h00 – 10h30, 11h00 – 12h30, and 14h00 – 15h30** via a virtual platform.
Advertising of the availability of the EIA Report for a 30-day review and comment period in the Rustenburg Herald (English advertisement).	02 November 2022
Distribution of notification letters announcing the availability of the EIA Report for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the surrounding area (including neighbouring landowners), registered I&APs and key stakeholder groups.	01 November 2022
30-day review and comment period of the EIA Report.	02 November 2022 – 02 December 2022
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: » Landowners. » Authorities and key stakeholders (including Organs of State, local municipality and official representatives of community-based organisations). » Where an I&AP does not have access to a computer and/or internet to participate in a virtual meeting telephonic discussions (including WhatsApp video call) will be set-up and minuted for inclusion. The preferred language of the I&AP has been considered when setting up these discussions.	Date to be confirmed
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs.	Throughout the S&EIA process

iv. Registered I&APs entitled to Comment on the EIA Report

43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –

(a) A lack of skills to read or write;
(b) Disability; or
(c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter of the release of the EIA Report for a 30-day review and comment period, invited to provide comment on the EIA Report, and informed of the manner in which, and timeframe within which such comment must be made. The report has been made available in soft copy. Hard copies of the report are available on request.

The EIA Report has been made available on the Savannah Environmental website (https://savannahsa.com/public-documents/energy-generation/). All registered I&APs were notified regarding the availability of the report. The notification was distributed prior to commencement of the 30-day review and comment period, on 04 November 2022. Where I&APs are not able to provide written comments (including SMS and WhatsApp), other means of consultation, such as telephonic discussions are used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development.

All comments raised as part of the discussions and written comments submitted during the 30-day review and comment period will be recorded and included in Appendix C of the Final EIA Report.

v. Identification and Recording of Comments

Comments raised by I&APs to date have been synthesised into a Comments and Responses (C&R) Report which is included in **Appendix C8.** The C&R Report includes detailed responses from members of the EIA project team and/or the Project Developer to the issues and comments raised during the public participation process to date. Comments received during the review period of the Draft EIA Report and responses to these will be included in the final EIA Report, which will be submitted to NWDEDECT for review and decision-making.

Meeting notes of all the telephonic discussions and virtual meetings conducted during the 30-day review and comment period of the Scoping Report are included in **Appendix C7**. Notes of meetings held during

the EIA Phase will also be included within this appendix within the Final EIA Report, which will be submitted to NWDEDECT for review and decision-making.

5.6 Outcomes of the DFFE Web-Based Screening Tool

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations 19 and 21 of the EIA Regulations.

The requirement for the submission of a Screening Report (included as **Appendix J** of the EIA Report) for the Project is applicable as it triggers Regulation 19 of the EIA Regulations, 2014, as amended. **Table 5.5** provides a summary of the environmental themes and/or specialist assessments identified in terms of the screening tool and responses to each theme and/or assessment from the project team considering the development footprint under consideration.

Table 5.5: Sensitivity ratings from the DFFE's web-based online Screening Tool associated with the development of the Project

Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agriculture Theme/Agricultural Impact Assessment	High	The Soils and Agricultural Potential Assessment is included in this EIA Report as **Appendix D**. Three (3) main sensitive soil forms were identified within the Project Site, namely the Vaalbos, Hutton and Tukulu soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with "Low" and "Moderate high" sensitivities, which correlates with the findings from the baseline assessment. The Project Site is associated with both the arable and non-arable soils.
Landscape (Solar) Theme/Visual Impact Assessment	Very high	The Visual Assessment is included in this EIA Report as **Appendix F.** The anticipated visual impacts range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed Solar PV Energy Facility are not considered to be fatal flaws for the proposed Project
Archaeological and Cultural Heritage Theme/Heritage Impact Assessment	Low	A Heritage Assessment is included in this EIA Report as **Appendix F**. The Heritage Assessment identified various heritage resources within the Development Footprint and grid connection corridor, including

Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
		archaeological resources and burial grounds and graves, which are rated as having a high heritage significance and will require further mitigation work before the Project can commence.
Palaeontology Theme/Heritage Impact Assessment	Medium	According to the PalaeoMap of SAHRIS, the Palaeontological Sensitivity of the proposed Development Footprint is zero or insignificant.
Terrestrial Biodiversity Theme/ Terrestrial Ecology Impact Assessment	Very high	A Terrestrial Ecology Assessment (including flora and fauna) has been undertaken for the Project and is included as **Appendix D** of the EIA Report. The Development Footprint has been altered both currently and historically. The degraded Bushveld habitat is however still regarded as important. The habitat sensitivity of the degraded Bushveld and all (artificial and natural) wetland/water resources is regarded as high and medium respectively.
Aquatic Biodiversity Theme/Freshwater Impact Assessment	Very high	A Freshwater Assessment has been undertaken for the Project and is included as **Appendix E** of the EIA Report. A key consideration for the impact assessment is the presence of the identified water resources in relation to the Development Footprint. The available data also suggests the presence of features in proximity to the development area, with wetlands system expected for the 500m regulation regulated area. Construction could result in the encroachment into water resources and result in the loss or degradation of these systems, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation which would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota. An increase in stormwater runoff could result in physical

Theme/Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
		changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems
Civil Aviation Theme	Low	The Civil Aviation Authority (CAA) and Air Traffic Navigation Services (ATNS) is being consulted throughout the S&EIA process to obtain input.
Defence Theme	Low	There is no military base located within close proximity to the proposed Project.
RFI Theme	Low	The Project Site under consideration for the development of the Project is located within an area that as classified as having low sensitivity for telecommunication. Telkom will however be consulted during the 30-day review and comment period of the EIA Report to provide written comment on the proposed Project.
Avian theme/Avifauna Impact Assessment	Very high	A Terrestrial Ecology Assessment (including avifauna) has been undertaken and is included in the EIA Report as **Appendix D**. The Southern African Bird Atlas Project (SABAP2) data lists 366 avifauna species that could be expected to occur within the larger area. Twenty (20) of these expected species are regarded as threatened. Two (2) of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the area.
Plant Species Assessment	Low	A Terrestrial Ecology Assessment has been undertaken for the Project and is included as **Appendix D** of the EIA Report. Based on the outcomes of the desktop study and field assessment and available data, it has been indicated that the Development Footprint falls within the areas identified as Low to Medium-Low Sensitivity.
Animal Species Assessment	Medium	
Social Impact Assessment	The screening report does not indicate a rating for this theme.	A Social Impact Assessment has been undertaken and is included in the EIA Report as **Appendix G**.

5.6.1 Assessment of Issues Identified throughout the EIA Process

Based on the outcomes of the Scoping Phase evaluation of the Project, the following studies were identified as requiring detailed assessment, The specialist consultants involved in the assessment of these impacts are indicated in **Table 5.6** below.

Table 5.6: Specialist studies undertaken as part of the EIA Phase

Specialist	Specialist Study	Appendix
Martinus Erasmus of The Biodiversity Company	Terrestrial Biodiversity Assessment	Appendix D
Jan Jacobs The Biodiversity Company	Avifaunal Impact Assessment	Appendix E
Rian Pienaar of The Biodiversity Company	Wetland Baseline and Risk Assessment	Appendix F
Matthew Mamera of The Biodiversity Company	Soil Assessment	Appendix F
Wouter Fourie and Michelle Sachse of PGS Heritage	Heritage Impact Assessment	Appendix G
Lourens du Plessis at LOGIS	Visual Impact Assessment	Appendix H
Nondumiso Bulunga / Molatela Ledwaba and peer reviewed by Tony Barbour of Tony Barbour Environmental Consulting	Social Impact Assessment	Appendix I

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the Solar PV Energy Facility. Identified impacts are assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high)
- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2
  - Medium-term (5–15 years) – assigned a score of 3
  - Long term (> 15 years) - assigned a score of 4
  - Permanent - assigned a score of 5
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment
  - 2 is minor and will not result in an impact on processes
  - 4 is low and will cause a slight impact on processes
  - 6 is moderate and will result in processes continuing but in a modified way
  - 8 is high (processes are altered to the extent that they temporarily cease)
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes
- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen)
  - Assigned a score of 2 is improbable (some possibility, but low likelihood)
  - Assigned a score of 3 is probable (distinct possibility)
  - Assigned a score of 4 is highly probable (most likely)

    - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures)
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high
- The **status**, which is described as either positive, negative or neutral
- The degree to which the impact can be reversed
- The degree to which the impact may cause irreplaceable loss of resources
- The degree to which the impact can be mitigated

The **significance** is determined by combining the criteria in the following formula:
S = (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area)
- **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated)
- **60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area)

Specialist studies also considered cumulative impacts associated with similar developments within the broader project area and within 30 km of the Project Site. The purpose of the cumulative assessment is to test if such impacts are relevant to the proposed Project in the proposed location (i.e., whether the addition of the proposed Project in the area will increase the impact). In this regard, specialist studies considered whether the construction of the proposed Project will result in:

- Unacceptable risk
- Unacceptable loss
- Complete or whole-scale changes to the environment or sense of place
- Unacceptable increase in impact

A conclusion regarding whether the proposed Project will result in any unacceptable loss or impact considering all the projects proposed in the area is included in the respective specialist reports.

As the Project Developer has the responsibility to avoid or minimise impacts and plan for their management (in terms of the requirements of NEMA and the 2014 EIA Regulations, as amended (GNR 326)), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. A Project specific EMPr and generic EMPrs for the onsite substation and power line that include all the mitigation measures recommended by the specialists for the management of significant impacts are included as **Appendix L, M** and **N** to this Draft EIA Report.

5.7 Assumptions and Limitations of the EIA Process

The following assumptions and limitations are applicable to the EIA process of the Buffelspoort Solar PV Energy Facility:

- All information provided by the Project Developer and I&APs to the environmental team was correct and valid at the time it was provided.
- It is assumed that the Development Footprint for the Solar PV Energy Facility identified by the Project Developer represents a technically suitable site for the establishment of the Buffelspoort Solar PV Energy Facility which is based on the design undertaken by technical consultants for the Project.
- The Development Footprint (the area that will be affected during the operation phase) will include the footprint for the Solar PV Energy Facility and associated infrastructure (i.e. internal access roads and grid connection infrastructure).
- The EIA Phase evaluation of impacts has been largely based on site surveys. This information has been used to inform this EIA report for Buffelspoort Solar PV Energy Facility.

Refer also to the specialist reports included in **Appendix D to J**.

5.8 Legislation and Guidelines that have informed the preparation of this EIA Report

The following legislation and guidelines have informed the scope and content of this EIA Report:

- National Environmental Management Act (Act No. 107 of 1998).
- EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended).
- Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations.
- Department of Environmental Affairs (2017), Integrated Environmental Management Guideline: Guideline on Need and Desirability.
- 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; and
- International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Several other Acts, standards or guidelines have also informed the project process and the scope of issues addressed and assessed in this EIA Report. A review of legislative requirements applicable to the proposed Project is provided in **Table 5.7**.

Table 5.7: Relevant legislative permitting requirements applicable to the Project

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that: "*Everyone has the right –* » *To an environment that is not harmful to their health or well-being, and* » *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:* ∗ *Prevent pollution and ecological degradation,* ∗ *Promote conservation, and* ∗ *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the "right to an environment clause" includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326). In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. Considering the capacity of the proposed Project (i.e., contracted capacity of 40MWp) and the triggering of Activity	NWDEDECT – Competent Authority	The listed activities triggered by the proposed Project have been identified and are being assessed as part of the S&EIA process currently underway for the Project. The S&EIA process will culminate in the submission of a Final EIA Report to NWDEDECT for review and decision-making.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	1 of Listing Notice 2 (GNR 325) a full S&EIA process is required in support of the application for EA.		
National Environmental Management Act (No 107 of 1998) (NEMA)	In terms of the "Duty of Care and Remediation of Environmental Damage" provision in Section 28(1) of NEMA every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. In terms of NEMA, it is the legal duty of a project developer to consider a project holistically, and to consider the cumulative effect of a variety of impacts.	NWDEDECT	While no permitting or licensing requirements arise directly by virtue of the proposed Project, this section finds application through the consideration of potential cumulative, direct, and indirect impacts. It will continue to apply throughout the life cycle of the Project.
Environment Conservation Act (No. 73 of 1989) (ECA)	The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces. The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties. In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).	NWDEDECT Rustenburg Local Municipality	Noise impacts are expected to be associated with the construction phase of the Project. Considering the location of the Development Footprint in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation. Noisy activities will however need to comply with the provisions of the Noise Control Regulations.
National Water Act (No. 36 of 1998) (NWA)	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e., is an existing lawful use), is permissible under	Regional Department of Water and Sanitation	Wetlands have been identified within the development area and grid corridor (**Appendix D**). As a result, a water use

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	a GA, or if a responsible authority waives the need for a licence. Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)). Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks or characteristics of a watercourse (Section 21(i)).		authorisation for the Project may be required from the DWS. Furthermore, groundwater will be abstracting by the use of boreholes for the construction and operational phase. A Water Use License Application will be lodged with the Department of Water and Sanitation.
Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)	In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.	DMRE	No borrow pits are expected to be required for the construction of the Project, and as a result, a mining permit (in accordance with Section 27(6) or EA in this regard is not required to be obtained.
	Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.		In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources and Energy to ensure that the proposed Project does not sterilise a mineral resource that might occur on Project Site. This application requires the final EIA Report to be submitted as supporting documentation and can thus

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			only commence once the Project development has reached this stage of the process.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)	The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas and provide a standard for acceptable dustfall rates for residential and non-residential areas. In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dustfall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme. Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.	NWDEDECT / Bojanala Platinum District	In the event (however highly unlikely) that the Project results in the generation of excessive levels of dust the possibility could exist that a dustfall monitoring programme would be required for the Project. In this case dustfall monitoring results from the dustfall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed.
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance. Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites. Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.	South African Heritage Resources Agency (SAHRA) North West Provincial Heritage Resources Agency (NWPHRA)	A full Heritage Impact Assessment has been undertaken for the Project as per the requirements of Section 38 of the NHRA. The HIA concludes that the heritage resources are present within the Development Footprint of the Buffelspoort Solar PV Energy Facility and OHL Grid Corridor. The initial projected impact is rated as **LOW** to **HIGH** on these heritage resources before mitigation measures.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development. Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.		Should a heritage resource be impacted upon, as identified during the Impact Assessment, a permit may be required from SAHRA or NWPHRA in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process. Three government notices have been published in terms of Section 56(1) of NEM:BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of	DFFE NEDEDECT	Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species. A Terrestrial Ecology Impact Assessment was undertaken as part of the EIA Phase which identified that the Development Footprint overlaps mainly with an EN ecosystem, and marginally with a LC ecosystem.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).		
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).	DFFE NWDEDECT	Eight (8) Invasive Alien Plant (IAP) species were recorded in the Development Footprint. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b. These IAP species must be controlled by implementing an IAP Management Programme, in compliance of Section 75 of the NEM:BA
Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)	Section 05 of CARA provides for the prohibition of the spreading of weeds. Regulation 15 of GN R1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur. Regulation 15E of GN R1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.	Department of Agriculture, Land Reform and Rural Development (DALRD)	CARA will find application throughout the life cycle of the Project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented. In terms of Regulation 15E (GN R1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods: » Uprooting, felling, cutting or burning. » Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			» Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation. » Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned, subject to the provisions of sub-regulation 4. » A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.
National Forests Act (No. 84 of 1998) (NFA)	According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734. The prohibitions provide that "no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister".	DFFE	During the field assessment two (2) species of protected trees were observed: *Berchemia zeyheri* (Pink-Ivory) and *Sclerocarya birrea* subsp *caffra* (Marula). The protected trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). A collection/destruction permit must be obtained from NWDEDECT for the removal of any protected plant species.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			Should these species be confirmed within the Development Footprint during any phase of the Project, permits will be required.
National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)	Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it. Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.	DFFE	While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the Project, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and trained personnel for firefighting purposes.
Hazardous Substances Act (No. 15 of 1973) (HAS)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to	Department of Health (DoH)	It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the DoH.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.		
National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)	The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:	DFFE – Hazardous Waste NWDEDECT – General Waste	No waste listed activities are triggered by the Project; therefore, no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM: WA will need to be considered in this regard.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	» The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and » Pollution of the environment and harm to health are prevented.		
National Road Traffic Act (No. 93 of 1996) (NRTA)	The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.	South African National Roads Agency (SANRAL) – national roads North West Department of Community Safety and Transport Management (NW DCSTM):	An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits required for vehicles carrying abnormally heavy or abnormally dimensioned loads and transport vehicles exceeding the dimensional limitations (length) of 22 m. Depending on the trailer configuration and height when loaded, some of the on-site substation and BESS components may not meet specified dimensional limitations (height and width) which will require a permit.
Provincial Policies / Legislation			

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Bophuthatswana Nature Conservation Act. No. 3 of 1973.	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: » Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats may not be destroyed or damaged; » The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; The Act provides lists of protected species for the Province.	NWDEDECT	During the field assessment two (2) species of protected trees were observed: *Berchemia zeyheri* (Pink-Ivory) and *Sclerocarya birrea* subsp *caffra* (Marula). The protected trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). A collection/destruction permit must be obtained from NWDEDECT for the removal of any protected plant or animal species found on site. Should these species be confirmed within the Development Footprint during any phase of the Project, permits will be required.

5.8.1 Best Practice Guidelines Birds & Solar Energy (2017)

The Best Practice Guidelines Birds & Solar Energy (2017) proposed by the Birds and Renewable Energy Specialist Group (BARESG) (convened by BirdLife South Africa and the Endangered Wildlife Trust) contain guidelines for assessing and monitoring the impact of solar generation facilities on birds in Southern Africa. The guidelines recognise the impact that solar energy may have on birds, through for example the alteration of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with elements of solar hardware and ancillary infrastructure; and the fact that the nature and implications of these effects are poorly understood.

The guidelines are aimed at Environmental Assessment Practitioners (EAPs), avifaunal specialists, developers and regulators and propose a tiered assessment process, including:

(i) Preliminary avifaunal assessment – an initial assessment of the likely avifauna in the area and possible impacts, preferably informed by a brief site visit and by collation of available data; also including the design of a site-specific survey and monitoring project should this be deemed necessary.
(ii) Data collection – further accumulation and consolidation of the relevant avian data, possibly including the execution of baseline data collection work (as specified by the preliminary assessment), intended to inform the avian impact study.
(iii) Impact assessment – a full assessment of the likely impacts and available mitigation options, based on the results of systematic and quantified monitoring if this was deemed a requisite at preliminary assessment.
(iv) Monitoring – repetition of baseline data collection, plus the collection of mortality data. This helps to develop a complete before and after picture of impacts, and to determine if proposed mitigation measures are implemented and are effective, or require further refinement. Monitoring may only be necessary for projects with the potential for significant negative impacts on birds (i.e. large area affected and / or vulnerable species present).

In terms of the guidelines, the quantity and quality of baseline data required to inform the assessment process at each site should be set in terms of the size of the site and the predicted impacts of the solar technology in question, the anticipated sensitivity of the local avifauna (for example, the diversity and relative abundance of priority species present, proximity to important flyways, wetlands or other focal sites) and the amount of existing data available for the area.

Data collection could vary from a single, short field visit (Regime 1, for e.g. at a small or medium sized site with low avifaunal sensitivity), to a series of multi-day survey periods, including the collection of various forms of data describing avian abundance, distribution and movement and spread over 12 months (Regime 3, for e.g. at a large developments located in a sensitive habitat, or which otherwise may have significant impacts on avifauna). **Table 5.8** is taken from the best practise guidelines and provides a summary of the recommended assessment regimes in relation to proposed solar energy technology, project size, and likely risk).

Table 5.8: Recommended avian assessment regimes in relation to proposed solar energy technology, project size, and known impact risks.

Type of technology*	Size**	Avifaunal Sensitivity***		
		Low	Medium	High
All except CSP power tower	Small (< 30ha)	Regime 1	Regime 1	Regime 2
	Medium (30 – 150ha)	Regime 1	Regime 2	Regime 2
	Large (> 150ha)	Regime 2****	Regime 2	Regime 3
CSP power tower	All	Regime 3		

Regime 1: One site visit (peak season); minimum 1 – 5 days.
Regime 2: Pre- and post-construction; minimum 2 – 3 x 3 – 5 days over 6 months (including peak season); carcass searches.
Regime 3: Pre- and post-construction; minimum 4 – 5 x 4 – 8 days over 12 months, carcass searches.

* Different technologies may carry different intrinsic levels of risk, which should be taken into account in impact significance ratings

** For multi-phased projects, the aggregate footprint of all the phases should be used. At 3ha per MW, Small = < 10MW, Medium = 10 – 50MW, Large = > 50MW.

*** The avifaunal sensitivity is based on the number of priority species present, or potentially present, the regional, national or global importance of the affected area for these species (both individually and collectively), and the perceived susceptibility of these species (both individually and collectively) to the anticipated impacts of development. For example, an area would be considered to be of high avifaunal sensitivity if one or more of the following is found (or suspected to occur) within the broader impact zone:

1) Avifaunal habitat (e.g. a wetlands, nesting or roost sites) of regional or national significance.
2) A population of a priority species that is of regional or national significance.
3) A bird movement corridor that is of regional or national significance.
4) A protected area and / or Important Bird and Biodiversity Area.

An area would be considered to be of medium avifaunal sensitivity if it does not qualify as high avifaunal sensitivity, but one or more of the following is found (or suspected to occur) within the broader impact zone

1) Avifaunal habitat (e.g. a wetland, nesting or roost sites) of local significance.
2) A locally significant population of a priority species.
3) A locally significant bird movement corridor.

An area would be considered to be of low avifaunal sensitivity if it is does not meet any of the above criteria.

**** Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g., local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. A single season survey (Regime 1) will be conducted as the Study Area as found to be void of any species of conservation or specialist species during the site visit undertaken as part of the Scoping and EIA Phase. Further to this, three (3) surveys on nearby sites conducted by The Biodiversity Company (i.e., the appointed avifauna specialist) in April 2022 found similar results. Therefore, a Regime 1 assessment was found to be adequate.

Furthermore, the animal sensitivity theme as per the DFFE screening report came out as medium with just the Secretary bird regarded as having a medium sensitivity. The field results were mainly (with the exception of the water sources) rated Moderate - Very Low as large parts of the development area and grid connection corridor have been degraded, which disputed the moderate classification of the whole area.

5.8.2 The IFC Environmental Health and Safety (EHS) Guidelines

The IFC EHS Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines have relevance to the proposed project:

- IFC EHS General Guidelines
- IFC Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, however no Industry Sector EHS Guidelines have been developed for PV solar power to date. The application of the General EHS Guidelines should be tailored to the hazards and risks associated with a project and should take into consideration site-specific variables which may be applicable, such as host country context, assimilative capacity of the environment, and other project factors. In instances where host country regulations differ from the standards presented in the EHS Guidelines, whichever is the more stringent of the two in this regard should be applied.

The General EHS Guidelines include consideration of the following:

- Environmental:
  - Air Emissions and Ambient Air Quality
  - Energy Conservation
  - Wastewater and Ambient Water Quality
  - Water Conservation
  - Hazardous Materials Management
  - Waste Management
  - Noise
  - Contaminated Land
- Occupational Health and Safety:
  - General Facility Design and Operation
  - Communication and Training
  - Physical Hazards
  - Chemical Hazards
  - Biological Hazards
  - Radiological Hazards
  - Personal Protective Equipment (PPE)
  - Special Hazard Environments
  - Monitoring
- Community Health and Safety:
  - Water Quality and Availability
  - Structural Safety of Project Infrastructure
  - Life and Fire Safety (L&FS)
  - Traffic Safety
  - Transport of Hazardous Materials
  - Disease Prevention
  - Emergency Preparedness and Response
- Construction and Decommissioning:

- Environment
- Occupational Health & Safety
- Community Health & Safety

5.8.3 IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015)

While no Industry Sector EHS Guidelines have been developed for PV Solar Power, the IFC has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). Chapter 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for solar PV power plants contained within the Project Developer's Guide include:

- Construction phase impacts (i.e. OHS, temporary air emissions from dust and vehicle emissions, noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation).
- Water usage (i.e. the cumulative water use requirements).
- Land matters (i.e. land acquisition procedures and the avoidance or proper mitigation of involuntary land acquisition / resettlement).
- Landscape and visual impacts (i.e. the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities).
- Ecology and natural resources (i.e. habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species).
- Cultural heritage (i.e. impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction).
- Transport and access (i.e. impacts of transportation of materials and personnel).
- Drainage / flooding (i.e. flood risk associated with the site).
- Consultation and disclosure (i.e. consultations with key authorities, statutory bodies, affected communities and other relevant stakeholders as early as possible).
- Environmental and Social Management Plan (ESMP) (i.e. compile an ESMP to ensure that mitigation measures for relevant impacts are identified and incorporated into project construction procedures and contracts)

CHAPTER 6: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the local environment. This information is provided in order to assist the reader in understanding the possible effects of the Project on the environment within which it is proposed to be developed. Aspects of the biophysical, social, and economic environment that could be directly or indirectly affected by, or could affect, the proposed development have been described. This information has been sourced from both existing information available for the area as well as collected field data undertaken by specialist consultants and aims to provide the context within which this EIA process is being conducted. The full impact assessments undertaken by the independent specialists, including details of the affected environment, are included in **Appendices D – G**.

6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Scoping Report

This chapter includes the following information required in terms of Appendix 3: Scope of Assessment and Content of the Environmental Impact Assessment Report.

Requirement	Relevant Section
3(1)(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	The environmental attributes associated with the development of the Project Site included as a whole within this chapter. The environmental attributes that are assessed within this chapter include the following: » The regional setting of the broader study area indicates the geographical aspects associated with the Project. This is included in **Section 6.2**. » The climatic conditions for the area have been included in **Section 6.3**. » The biophysical characteristics of the project site and the surrounding areas are included in **Section 6.4**. The characteristics considered are topography and terrain, geology, soils and agricultural potential and the ecological profile which includes the vegetation patterns, listed plant species, critical biodiversity areas and broad-scale processes, freshwater resources, terrestrial fauna and avifauna. » The heritage and cultural aspects (including archaeology and palaeontology) has been included in **Section 6.5**. » The social and socio-economic characteristics associated with the broader study area and the project site has been included in **Section 6.6** » The visual quality, land-use and settlement patterns of the affected environment is included in **Section 6.7**

6.2. Regional Setting

The proposed Project is located approximately 6 km west of Mooinooi within the jurisdiction of the Rustenburg Local Municipality and the Bojanala Platinum District Municipality, in the North West Province.

The North West Province is situated in the central-northern extent of South Africa. The Province is bordered by Northern Cape Province to the west, and south-west; Free State Province to the south; Gauteng Province to the east; Limpopo Province to the north-east; and Botswana to the north. It occupies an area of land approximately 104 882 km² in extent, making it South Africa's 6th largest in terms of surface area; and has a population of 3 748 436.

The North West Province is characterised by altitudes ranging from 920 – 1 782 metres above mean sea level (mamsl), which makes it one of the provinces with the most uniform terrain. The central and western extents of the Province are characterised by gently undulating plains, while the eastern extent is characterised as mountainous, and includes the Magaliesberg mountain range. Ancient igneous rock formations dominate the north-eastern and north-central extent of the Province; and the Gatsrand between Potchefstroom and Carletonville is considered to be one of the most ancient preserved landscapes in the world. The geology of the Province is significant given its mineral resources which are rich in platinum, gold, uranium, iron, chrome, manganese and diamonds.

In terms of land use patterns, approximately 69% of the North West Province is in a natural, or near-natural state; while 31% of the province is irreversibly modified as a result of croplands (25.6%), urban (3.5%), and mining (0.7%) activities. The Province is predominantly rural with the main economic activities comprising mining and agriculture. The North West Province comprises four (4) Districts, namely Bojanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompati, and Dr Kenneth Kaunda (refer to **Figure 6.1**).

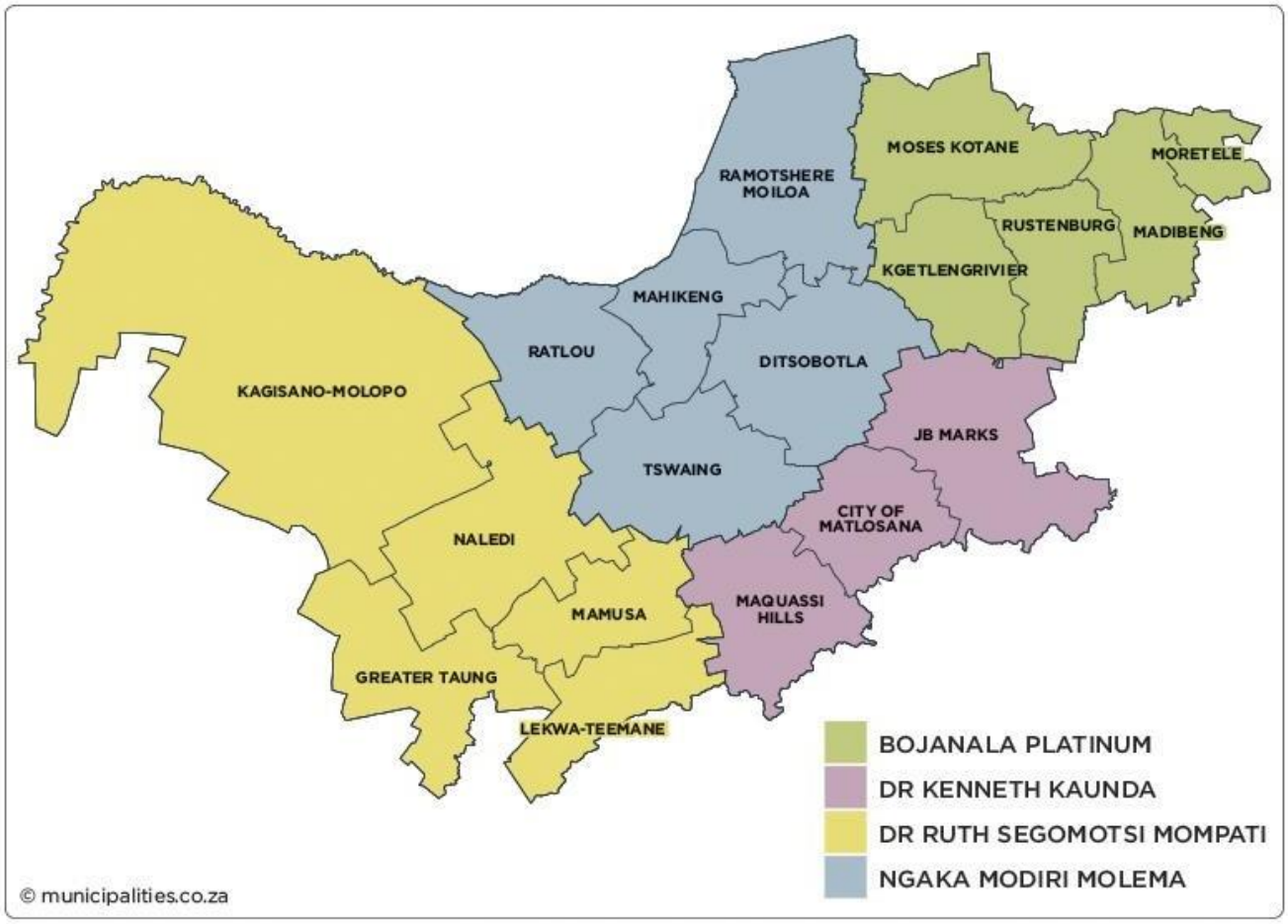


Figure 6.1: Districts under the North West Province (Source: Municipalities of South Africa).

The Bojanala Platinum District Municipality (BPDM) is a Category C municipality and is the home of the cradle of humankind and is strategically located on the 'platinum belt' of the north-eastern side of the North West province. To the north the BPDM is surrounded by Waterberg District Municipality (Limpopo Province), Tshwane Metropolitan Municipality (Gauteng Province), West Rand District Municipality (Gauteng Province) to the Southeast. To its south is Dr Kenneth Kaunda District Municipality and the Ngaka

Modiri Molema District Municipality to the west. The seat of Bojanala Platinum is Rustenburg (Source: Municipalities of South Africa).

The BPDM accounts for a total population of 1.81 million, or 44.5% of the total population in the North-West Province, which is the most populous District in the Province for 2018. The ranking in terms of the size of BPDM compared to the other District remained the same between 2008 and 2018. The Bojanala District spans over 18 333 km² and has five (5) local municipalities (Kgetleng River, Madibeng, Moses Kotane, Moretele and Rustenburg) with a total of 139 wards.

The District is amongst the least deprived in the North West Province, with only eight (8) wards that can be deemed as vulnerable. The least vulnerable people live in the Rustenburg Local Municipality. The main economic sectors are mining (30-35%), community services (15-20%), finance (10-15%), trade (10-15%), transport (5-10%), and manufacturing (5-10%). The District consists of rural municipalities.. The Bojanala District Municipality is spread over former homeland areas, commercial farms, towns, and semi –urban areas, with large areas of land under the custodianship of traditional authorities. According to the BPDM IDP, 32% of the total land area of the district is under the control of traditional authorities. There are 31 senior traditional leaders and 21 headman/headwomen within the District.

The villages and towns that make up the various municipalities are scattered throughout the District. This proves problematic as due to the distances between these villages and towns to main supplier pipelines which in turn require more financial and infrastructure investment. A backlog in terms of the development of internal roads, or provincial roads should also be noted dur to these distances, which in turn leads to a disconnect, a lack of accessibility between the District's various municipalities, its towns and its people. Electricity is also a challenge that needs to be addressed. Over and above the infrastructure challenges, the District phases unemployment amongst the youth, which needs attention, and it is recommended that industrialisation should be funded to improve skills amongst the youth (Source: Municipalities of South Africa).

Approximately 63% of the total economic activity of North West is concentrated into the four (4) local economies of Madibeng, Rustenburg, Mahikeng and Matlosana Municipalities. These municipalities represent approximately 50% of the North West population and 58% of the North West labour force.

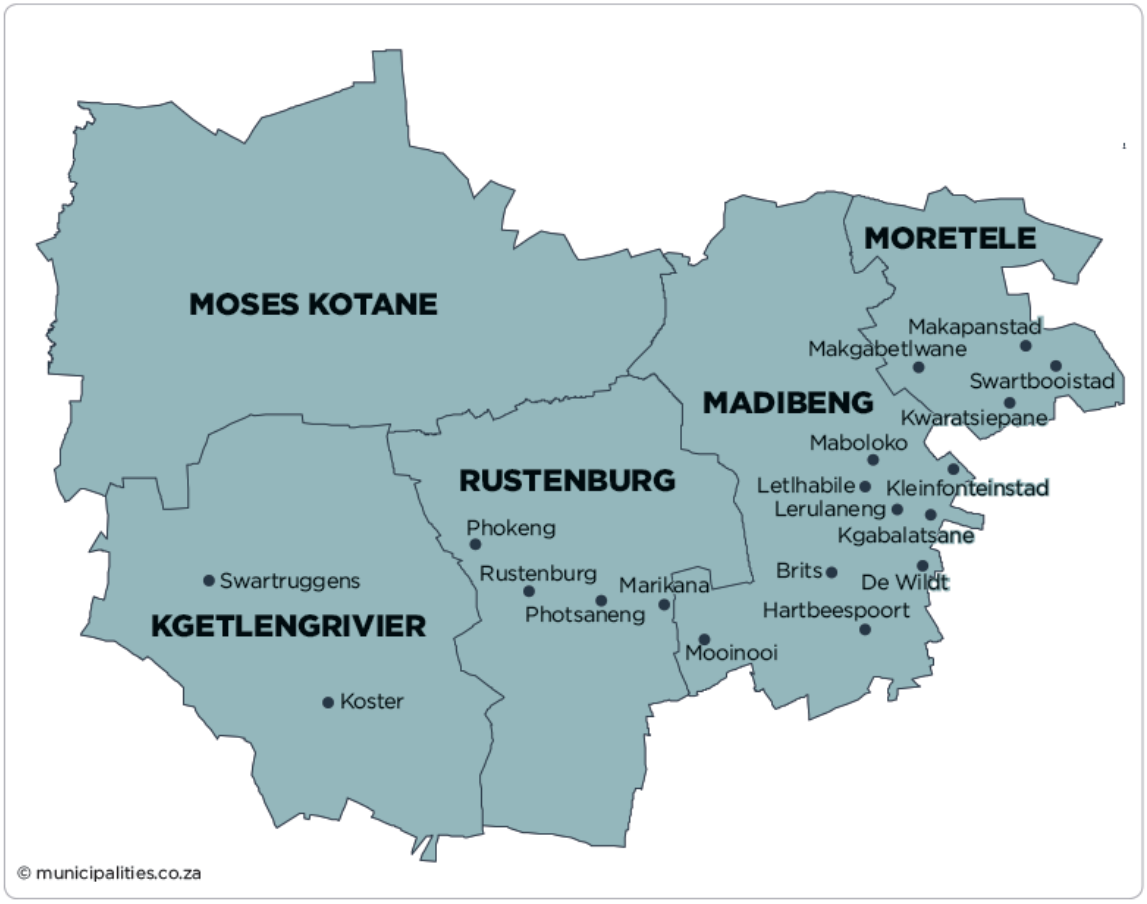


Figure 6.2: Map showing the Bonjana Platinum District and local municipalities within the District (Source: Municipalities of South Africa)

The primary economic sector in this District is Mining, which generates more than half of the District's Gross Domestic Product (GDP) and accounts for ~R 71.5 billion or 52.1% of the total Gross Value Added (GVA) in the district municipality's economy. The District holds the largest Platinum Group Metal (PGM) reserves in the country and the country holds 80% of the world's reserves. Consequently, it contributes by over 20% to the national mining economy.

Over and above PGMs the District also produces Chrome, Diamond, Slate and Silica. In the context of the Bojanala District, the bulk of platinum mining activity is located in the Rustenburg Local Municipal area. The platinum mining belt runs parallel to the north of the Magalies Mountain which extends from the Pilanesberg right up to the City of Tshwane to the Far East. Also evident is the concentration of informal settlements along the mining belt.

Agriculture is the most prominent land use in the BPDM, particularly in the Madibeng and Kgetleng River municipal areas. The District has a dualistic agricultural economy, which is comprised of a well-developed commercial sector and a predominantly subsistence sector in communal/rural areas. Agriculture contributes to approximately 2,6% to the total GDP and 19% to formal employment within the District. Some of the largest cattle herds can be found in the area thus its nickname the "Texas of South Africa", with the area around Rustenburg and Brits being fertile for mixed-crop farming. From a labour-intensive growth perspective, the sector remains strategic to the growth of the District.

The Rustenburg Local Municipality is a Category B municipality situated within the Bojanala Platinum District that covers an aerial extent of 3 416 km^2. The major towns or cities in the municipality are Hartbeesfontein-A, Marikana, Phatsima, Tlhabane and Rustenburg with Rustenburg being the seat of the municipality. Mining and trade are the primary economic sectors in the municipality.

6.3. Climatic Conditions

The climate of the broader Project Area is characterised by high and low temperature during summer and winter. Summer temperatures range between 22 and 34°C and winter brings with it dry, sunny days and chilly nights. The average winter (from May to July) temperature is 16°C but can range from an average of 2 to 20°C in a single day. Summer rainfall with a Mean Annual Precipitation (MAP) that ranges between 600 mm and 700 mm (refer to **Figure 6.3**).

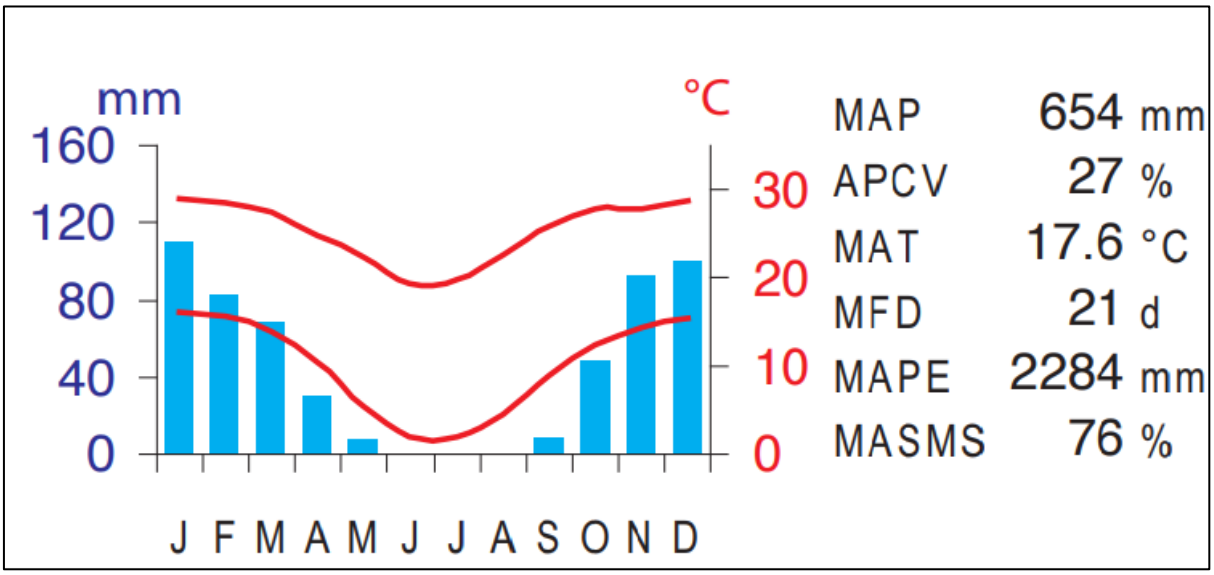


Figure 6.3: Climate for the study area

6.4. Biophysical Characteristics

The following section provides an overview and description of the biophysical characteristics of the study area and has been informed by specialist studies (**Appendix D-G**) undertaken as part of the S&EIA process.

6.4.1. Topography and Terrain

The topography of the study area is divided into two (2) distinct classes, where the northern parts are described as plains and undulating plains, and the southern parts consist of mountains and tall hills. The terrain elevation ranges from approximately 1 140m above sea level in the north and 1 560m to the south at the top of the mountains. These mountains are the northern foothills of the Magaliesberg Mountains, located further south of the Project Site.

The slope percentage of the Development Area has been calculated and is illustrated in **Figure 6.4**. Most of the regulated area is characterised by a slope percentage between 0 and 10%, with some irregularities in areas with slopes reaching 45%. This illustration indicates a non-uniform topography with occurrence of some steep sloping areas being present.

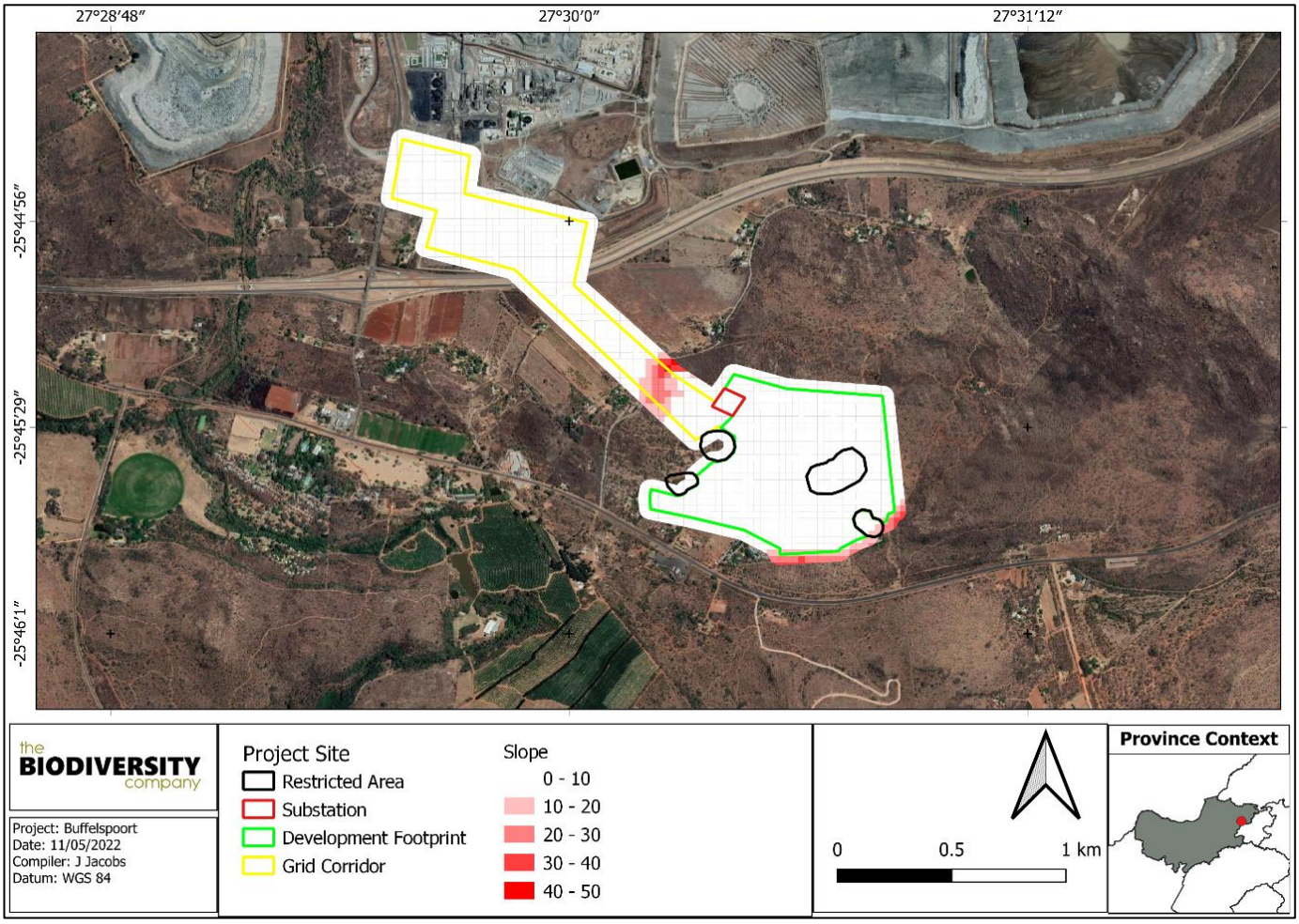


Figure 6.4: Slope percentage for the Development Footprint

6.4.2. Geology, Soils, Land Type and Agricultural Potential

Geological Setting of the Development Area

Most of the Development Footprint and Grid Connection Corridor is underlain by mafic intrusive rocks of the Rustenburg Layered Suite of the Bushveld Igneous Complex. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute to the geology.

Soil and Land Types

According to the land type database, the Development Footprint and Grid Connection Corridor fall within the Bc 8 and Ea 3 land types. The Bc 8 and Ea 3 land types mostly consist of Rensburg, Dundee, Arcadia, Hutton, and/Oakleaf soil forms according to the South African soil classification working group (1990), with the possibility of other soils occurring throughout. The Bc 8 land type terrain units and expected soils are illustrated in **Figure 6.5** and **Table 6.1**, respectively. The Ea 3 land type terrain units and expected soils are illustrated in **Figure 6.6** and **Table 6.2**, respectively.

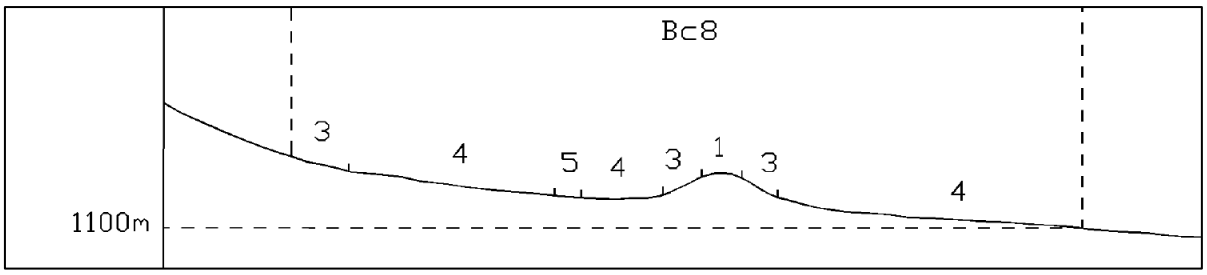


Figure 6.5: Illustration of land type Bc 8 terrain units (Land Type Survey Staff, 1972 – 2006)

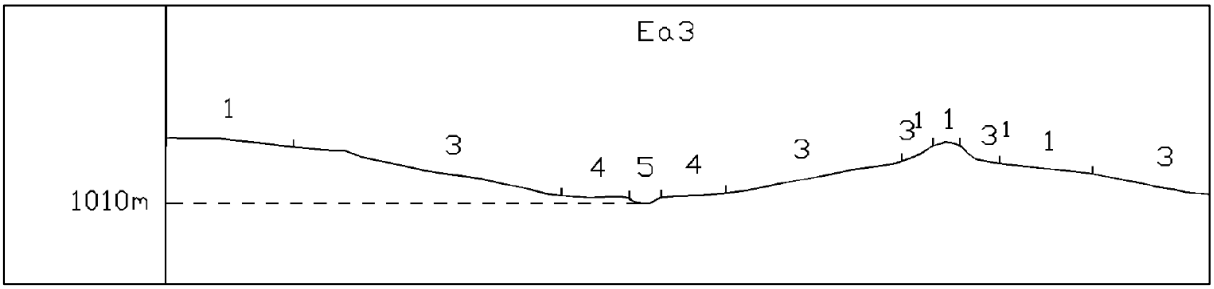


Figure 6.6: Illustration of land type Ea 3 terrain units (Land Type Survey Staff, 1972 – 2006)

Table 6.1: Soils expected at the respective terrain units within the Bc 8 land type (Land Type Survey Staff, 1972 - 2006)

Terrain units							
1 (2%)		**3 (8%)**		**4 (85%)**		**5 (5%)**	
Bare Rocks	50%	Mispah	50%	Hutton	40%	Rensburg, Dundee	60%
Mispah	50%	Bare Rocks	44%	Avalon	18%	Mispah	10%
		Hutton	6%	Clovelly	7%	Katspruit	10%
				Shortlands	6%	Arcadia	10%
				Bare Rocks	6%	Shortlands	6%
				Katspruit	5%	Bare Rocks	4%
				Arcadia	1%		

Table 6.2: Soils expected at the respective terrain units within the Ea 3 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units											
1 (30%)		**1 (1) (0.5)**		**3 (44.5%)**		**3(1) (1%)**		**4 (15%)**		**5 (9%)**	
Arcadia	70%	Bare Rocks	80%	Arcadia	76%	Bare Rocks	70%	Arcadia	89%	Oakleaf	67%
Bare Rocks	14%	Mispah	9%	Bare Rocks	10%	Mispah	30%	Hutton	3%	Arcadia	22%
Mispah	9%			Mispah	6%			Shortlands	3%	Shortlands	6%
Hutton	4%			Hutton	4%			Swartland	3%	Hutton	5%
Shortlands	3%			Shortlands	3%						
				Glenrosa	4%						
				Swartland	1%						

Agricultural Potential

Land capability is divided into eight (8) classes, and these may be divided into three (3) capability groups, namely, arable land, grazing land and wildlife. **Table 6.3** shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use and sensitivity increases from class I to class VIII (Smith, 2006).

Table 6.3: Land capability class and intensity of use (Smith, 2006)

Land capability class	**Increased Intensity of Use**									
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	F	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife

W- Wildlife	**F- Forestry**	**LG-Light Grazing**
MG-Moderate Grazing	IG- Intensive Grazing	LC – Light Cultivation
MC- Moderate Cultivation	IC- Intensive Cultivation	VIC – Very Intensive Cultivation

The land potential classes are determined by combining the land capability results and the climate capability of a region as shown in **Table 6.4**. The final land potential results are then described in **Table 6.5**. These land potential classes are regarded as the final delineations subject to sensitivity, given the comprehensive addition of climatic conditions as those relevant to the DAFF (2017) land capabilities. The main contributors to the climatic conditions as per Smith (2006) is that of MAP, Mean Annual Potential Evaporation (MAPE), mean September temperatures, mean June temperatures and mean annual temperatures.

Table 6.4: The combination table for land potential classification

Land capability class	**Climate capability class**							
	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 6.5: The land potential classes

LC	**Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.**
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures or rainfall. Non-arable

Various soil forms are expected throughout the Development Footprint and Grid Connection Corridor, of which some are commonly associated with high land capabilities. Even though the soil depth, texture and permeability of these soils ensure high land capability, the climatic capability of the area often reduces the land potential considerably.

The agriculture theme sensitivity as indicated in the screening report indicates predominantly medium sensitivity, with patches of low and high occurring within the development area and grid connection corridor. In field assessments have shown the Development Footprint and Grid Connection Corridor as predominantly comprising areas of medium land capability sensitivity, with patches of low and high land capability sensitivity. Field crop boundaries have been identified in some areas along the Grid Connection Corridor.

6.4.3. Land Use

The most prominent (and visible) land use within the project site is the mining activities, mining infrastructure and waste rock dumps. Interspersed with these mining activities are agricultural land uses, ranging from irrigated agriculture, dryland agriculture and citrus farming (orchards) predominantly to the south. Agricultural activities include the production of maize, wheat and sunflower crops, as well as cattle farming. The farmers working these fields predominantly reside at homesteads or farm residences scattered throughout the project site. Homesteads located in closer proximity to the proposed Project Site include, Mizpah, Maakiesaakie, Dassieklip and Elandsdrif.

6.4.4. Ecological Profile

i. Broad-Scale Vegetation Patterns

The Development Footprint and Grid Connection Corridor overlap with the Marikana Thornveld and Moot Plains Bushveld vegetation types (refer to **Figure 6.7**).

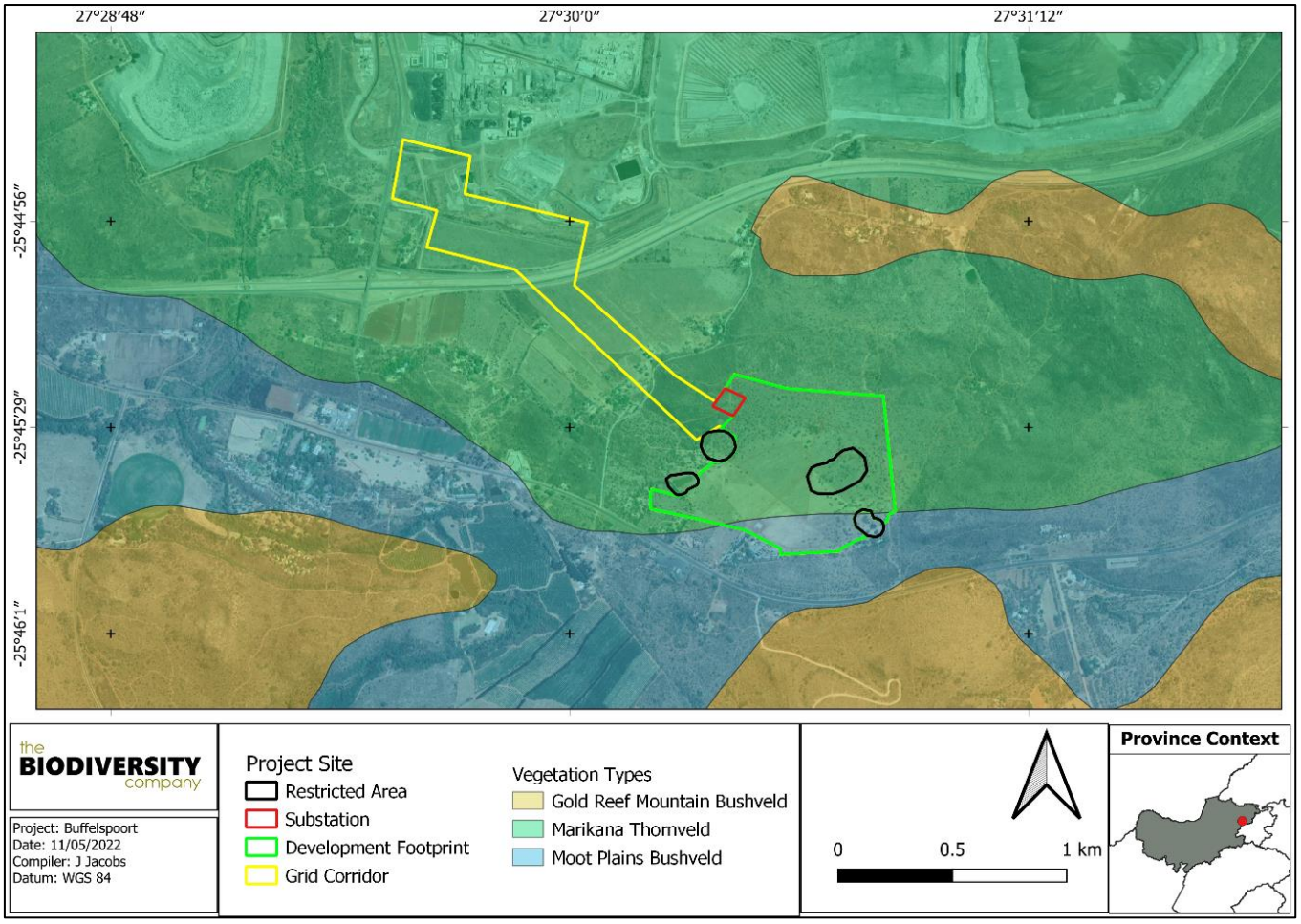


Figure 6.7: Map illustrating the vegetation types associated with the Development Footprint and Grid Connection Corridor

Marikana Thornveld

Marikana Thornveld extends on the broad plains from Rustenburg in the West, through Marikana and Brits, and towards Pretoria in the East. It is characterised by open *Vachellia karroo* woodland, which occurs in valleys and on undulating plains and hills. Fire-protected habitats, such as drainage lines, rocky outcrops and termitaria are typically dominated by denser, shrub-dominated vegetation.

Important Plant Taxa in the Marikana Thornveld

Based on Mucina and Rutherford's (2006) vegetation classification, important plant taxa are those species that have a high abundance, a frequent occurrence (not being particularly abundant) or are prominent in the landscape within a particular vegetation type. They note the following species are important taxa in the Marikana Thornveld vegetation type:

» **Tall Tree**: *Senegalia burkei*.
» **Small Trees**: *Senegalia caffra*, *Vachellia gerrardii*, *Vachellia karroo*, *Combretum molle*, *Searsia lancea*, *Ziziphus mucronata*, *Vachellia nilotica*, *Vachellia tortilis* subsp. *heteracantha*, *Celtis africana*, *Dombeya rotundifolia*, *Pappea capensis*, *Peltophorum africanum*, *Terminalia sericea*.

- **Tall Shrubs**: *Euclea crispa* subsp. *crispa*, *Olea europaea* subsp. *africana*, *Searsia pyroides* var. *pyroides*, *Diospyros lycioides* subsp. *guerkei*, *Ehretia rigida* subsp. *rigida*, *Euclea undulata*, *Grewia flava*, *Pavetta gardeniifolia*.
- **Low Shrubs**: *Asparagus cooperi*, *Rhynchosia nitens*, *Indigofera zeyheri*, *Justicia flava*.
- **Woody Climbers**: *Clematis brachiata*, *Helinus integrifolius*.
- **Herbaceous Climbers:** *Pentarrhinum insipidum*, *Cyphostemma cirrhosum*.
- **Graminoids**: *Elionurus muticus*, *Eragrostis lehmanniana*, *Setaria sphacelata*, *Themeda triandra*, *Aristida scabrivalvis* subsp. *scabrivalvis*, *Fingerhuthia africana*, *Heteropogon contortus*, *Hyperthelia dissoluta*, *Melinis nerviglumis*, *Pogonarthria squarrosa*.
- **Herbs**: *Hermannia depressa*, *Ipomoea obscura*, *Barleria macrostegia*, *Dianthus mooiensis* subsp. *mooiensis*, *Ipomoea oblongata*, *Vernonia oligocephala*.
- **Geophytic Herbs**: *Ledebouria revoluta*, *Ornithogalum tenuifolium*, *Sansevieria aethiopica*.

Conservation Status of the Marikana Thornveld

According to Mucina and Rutherford (2006), the Marikana Thornveld is classified as Endangered, with its national conservation target being 19%. Over 48% has already been transformed by urban expansion and cultivation, and alien invasive plants occur in high densities, especially along drainage lines (Mucina & Rutherford, 2006). Erosion is very low to moderate (Mucina & Rutherford, 2006). Less than 1% is conserved in the Magaliesberg Nature Area, De Onderstepoort Nature Reserve and other reserves.

Moot Plains Bushveld

The main belt of the Moot Plains Bushveld extends from the Selons River Valley south of the Magaliesberg, through Maanhaarrand and the valley bottom of the Magalies River, east of the Hartebeestpoort Dam between the Magaliesberg and Daspoort mountain ranges and to Pretoria (Mucina & Rutherford, 2006). It is characterised by low-lying savanna dominated by *Vachellia* species. occurring on the bottomlands and plains, or woodlands on the lower hillsides vary in height and density (Mucina & Rutherford, 2006). Grasses dominate the herbaceous layer (Mucina & Rutherford, 2006).

Important Plant Taxa in the Moot Plains Bushveld

Mucina and Rutherford (2006) noted the following species as important taxa in the Moot Plains Bushveld:

- **Small trees:** *Vachellia nilotica*, *Vachellia tortillis* subsp. *heteracantha*, *Searsia lancea*.
- **Tall shrubs:** *Buddleja saligna*, *Euclea undulata*, *Olea europaea* subsp. *africana*, *Grewia occidentalis*, *Gymnosporia polyacantha*, *Mystroxylon aethiopicum* subsp. *burkeanum*.
- **Low shrubs:** *Aptosimum elongatum*, *Felicia fascicularis*, *Lantana rugosa*, *Teucrium trifidum*.
- **Succulent shrub:** *Kalanchoe paniculata*.
- **Woody climber:** *Jasminum breviflorum*.
- **Herbaceous climber:** *Lotononis bainesii*.
- **Graminoids:** *Heteropogon contortus*, *Setaria sphacelata*, *Themeda triandra*, *Aristida congesta*, *Chloris virgata*, *Cynodon dactylon*, *Sporobolus nitens*, *Tragus racemosus*.
- **Herbs:** *Achyropsis avicularis*, *Corchorus asplenifolius*, *Evolvulus alsinoides*, *Helichrysum nudifolium*, *Helichrysum undulatum*, *Hermannia depressa*, *Osteospermum muricatum*, *Phyllanthus maderaspatensis*.

ii. ii. Expected Flora Species

The Plants of Southern Africa (POSA) database indicates that 508 species of indigenous plants are expected to occur within the Development Area and Grid Connection Corridor. Three (3) flora species of conservation concern (SCC), based on their conservation status, could be expected to occur within the Development Area and Grid Connection Corridor and are provided in **Table 6.6** below.

Table 6.6: Threatened flora species that may occur within the Development Area and Grid Connection Corridor

Family	Taxon	Author	IUCN	Ecology
Crassulaceae	*Adromischus umbraticola* subsp. *Umbraticola*	C.A.Sm.	NT	Indigenous; Endemic
Aizoaceae	*Delosperma leendertziae*	N.E.Br.	NT	Indigenous; Endemic
Apocynaceae	*Stenostelma umbelluliferum*	(Schltr.) Bester & Nicholas	NT	Indigenous; Endemic

iii. iii. Critical Biodiversity Areas and Ecological Support Areas

The conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

The purpose of the North-West Biodiversity Sector Plan (NWBSP) (2015) is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely CBA1 areas, CBA2 areas, ESA1 areas and ESA2 areas based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

Figure 6.8 below shows the Development Area and grid connection corridor superimposed on the Terrestrial CBA maps. The Development Area and grid connection corridor overlap with a CBA2, an ESA1 and an ESA2

.

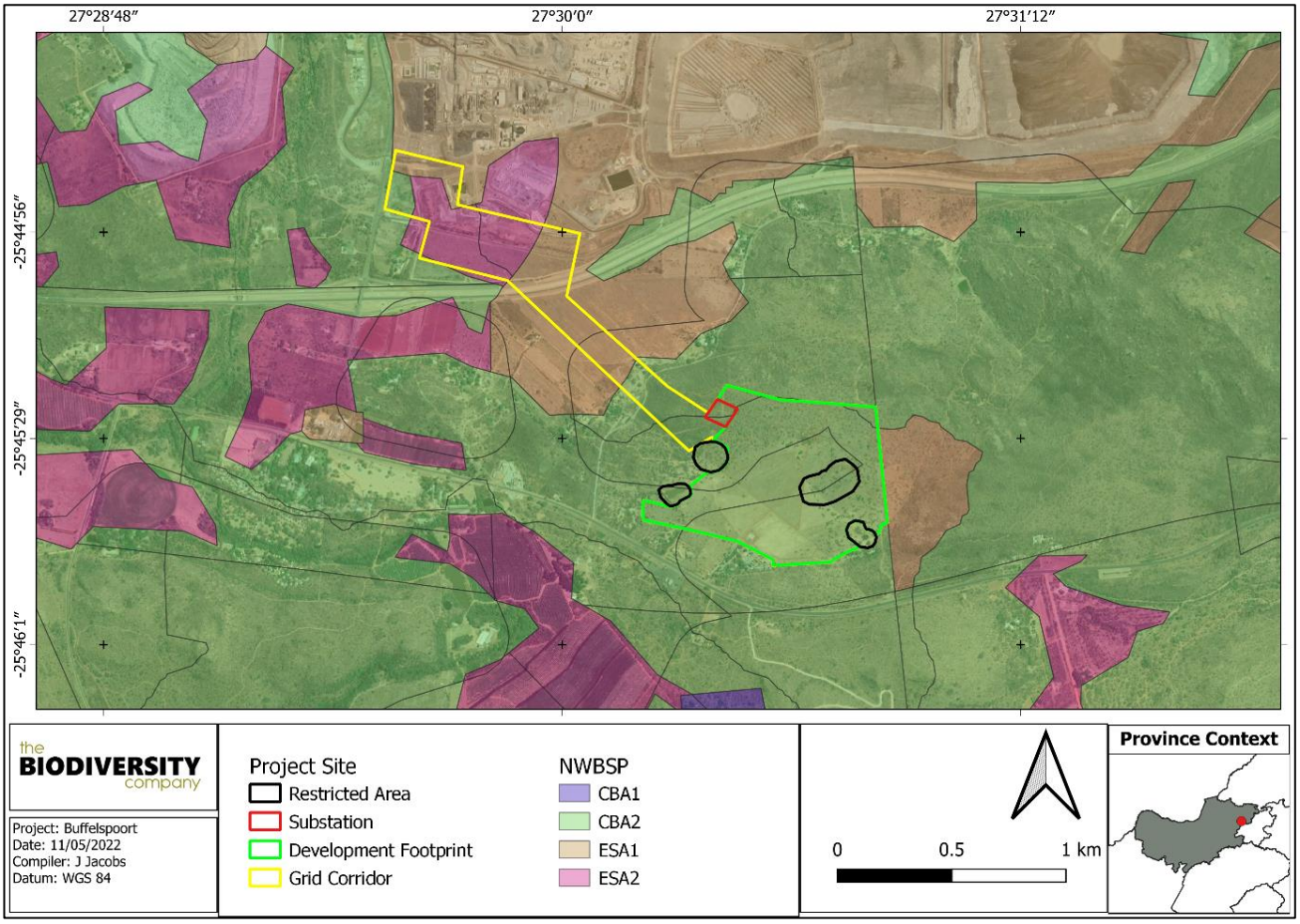


Figure 6.8: Map illustrating the locations of CBAs and ESAs within the Development Footprint and Grid Connection Corridor

iv. iv. Ecosystem Threat Status and Protection Level

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed Project overlaps mainly with an EN ecosystem, and marginally with a LC ecosystem (refer to **Figure 6.9**).

The Ecosystem Protection Level is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed Project overlaps with a PP ecosystem (refer to **Figure 6.10**).

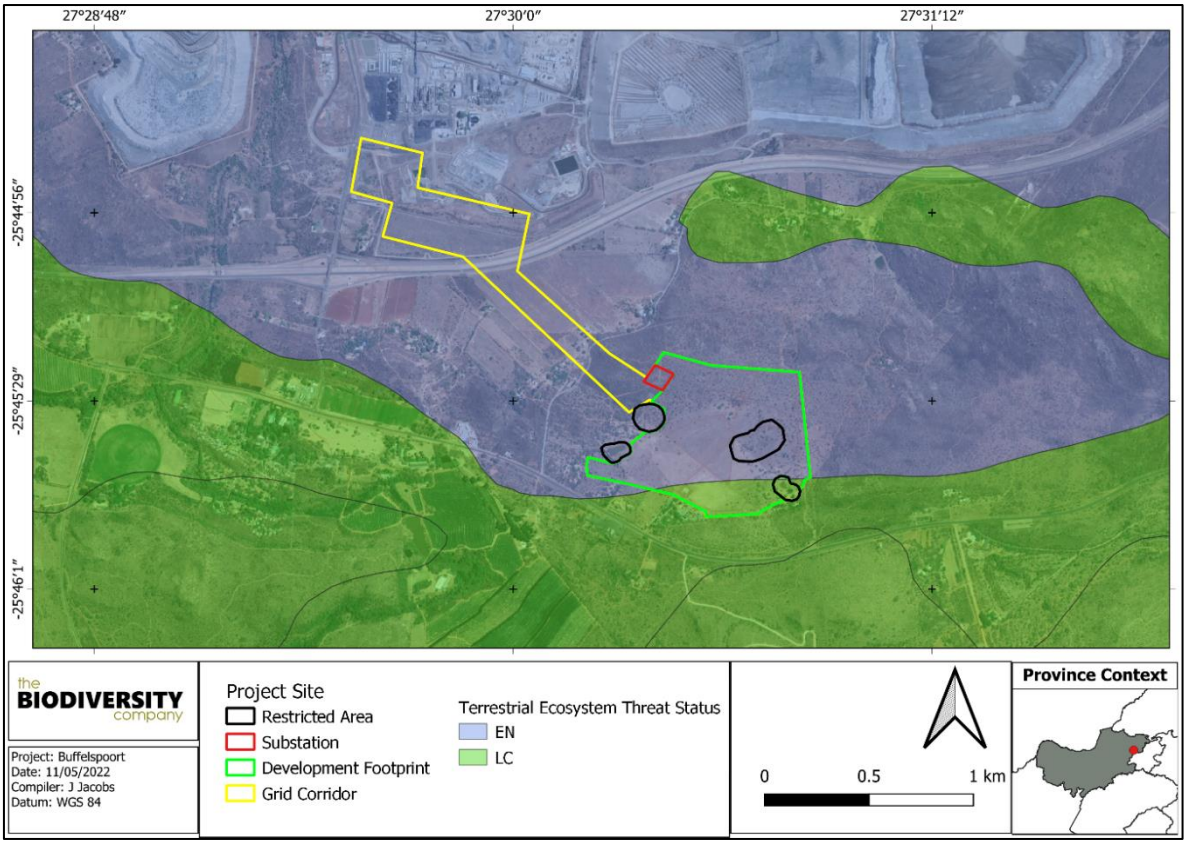


Figure 6.9: Map illustrating the ecosystem threat status associated with the Development Footprint and Grid Connection Corridor

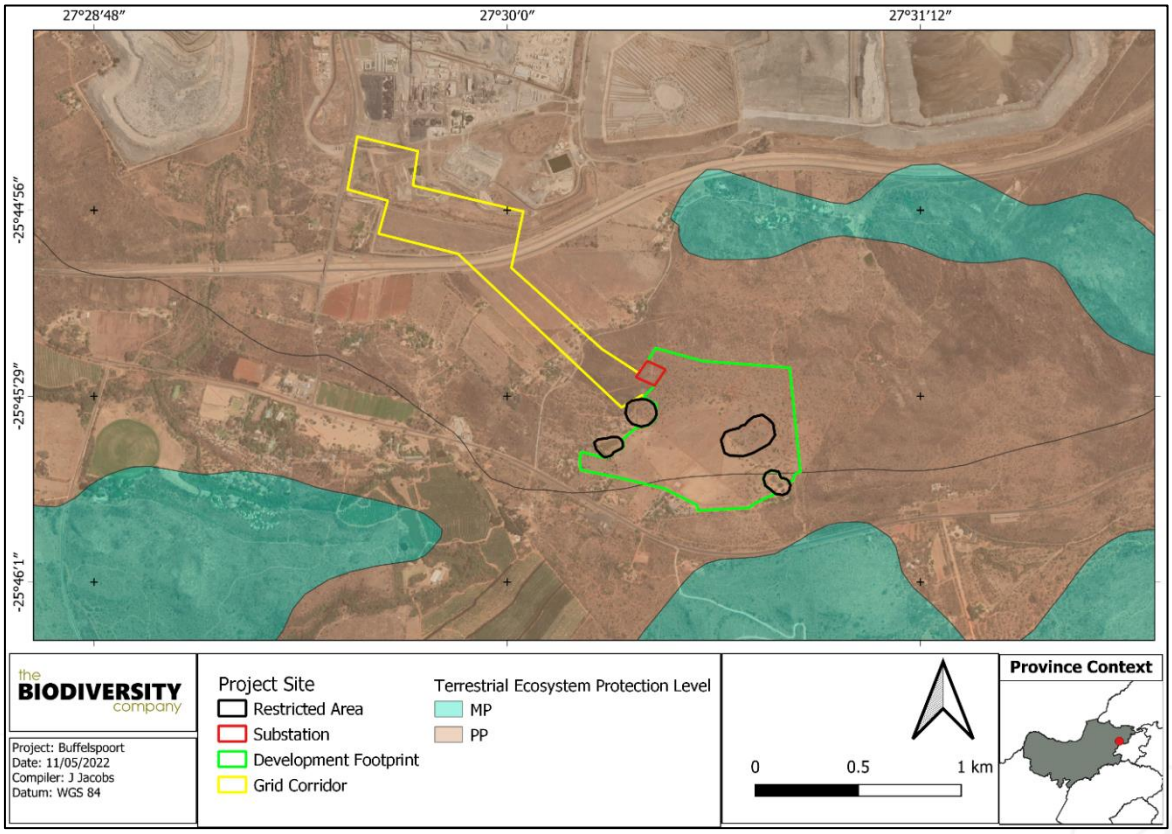


Figure 6.10: Map illustrating the ecosystem protection level associated with the Development Footprint and Grid Connection Corridor

v. v. Protected Areas and National Protected Areas Expansion Strategy Focus Areas

According to the protected area spatial datasets from the South African Protected Areas Database SAPAD (2021) and SACAD (2021), the proposed Project overlaps with the Magaliesberg Biosphere Reserve (refer to **Figure 6.11**), with the Development Footprint encroaching into areas designated as a Buffer Zone and the grid connection corridor extending into a Transition Area. The Development Footprint (at the closest point) is located approximately 12km from the core of the Biosphere.

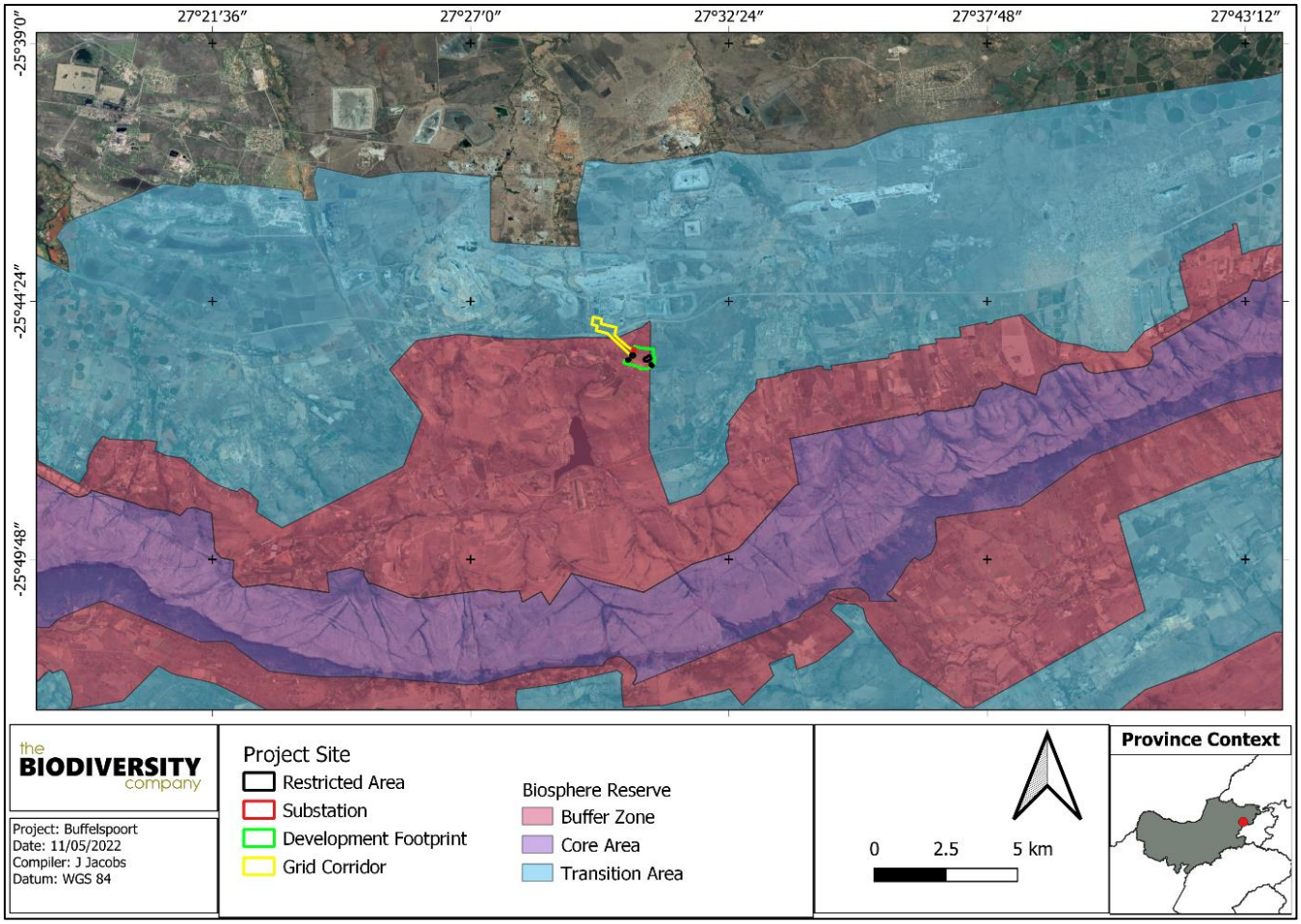


Figure 6.11: The Project in relation to protected areas

The National Protected Area Expansion Strategy 2016 (NPAES) focus areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016).

Field Assessment

A single field survey was undertaken on the 17th of May 2022.

a) Flora Assessment

Indigenous Flora

The vegetation assessment was conducted throughout the extent of the PAOI. The tree, shrub and herbaceous plant species were recorded in the PAOI during the field assessment can be seen in the table below.

Table 0-3 Trees, shrub and herbaceous plant species recorded on the Development Area.

Family	*Scientific Name*	Threat Status (SANBI, 2021)	SA Endemic	Alien Category
Agavaceae	*Chlorophytum cooperi*	LC	Not Endemic	
Amaryllidaceae	*Haemanthus humilis*	LC	Not Endemic	
Anacardiaceae	*Searsia lancea*	LC	Not Endemic	
Anacardiaceae	*Ozoroa paniculosa*	LC	Not Endemic	
Anacardiaceae	*Searsia zeyheri*	LC	Endemic	
Anacardiaceae	*Sclerocarya birrea subsp. caffra*	LC-Protected Tree	Not Endemic	
Apocynaceae	*Gomphocarpus fruticosus*	LC	Not Endemic	
Araliaceae	*Cussonia spicata*	LC	Not Endemic	
Asparagaceae	*Asparagus cooperi*	LC	Not Endemic	
Asphodelaceae	*Aloe davyana*	LC	Not Endemic	
Asteraceae	*Nidorella anomala*	LC	Not Endemic	
Asteraceae	*Kleinia longiflora*	LC	Not Endemic	
Asteraceae	*Geigeria burkei*	LC	Not Endemic	
Asteraceae	*Felicia muricata*	LC	Not Endemic	
Asteraceae	*Dicoma anomala*	LC	Not Endemic	
Asteraceae	*Helichrysum rugulosum*	LC	Not Endemic	
Boraginaceae	*Ehretia rigida*	LC	Endemic	
Cannabaceae	*Celtis africana*	LC	Not Endemic	
Celastraceae	*Maytenus albata*	LC	Endemic	
Combretaceae	*Combretum hereroense*	LC	Not Endemic	
Combretaceae	*Combretum molle*	LC	Not Endemic	
Combretaceae	*Combretum zeyheri*	LC	Not Endemic	
Ebenaceae	*Diospyros lycioides subsp. lycioides*	LC	Not Endemic	
Ebenaceae	*Euclea crispa subsp. crispa*	LC	Not Endemic	
Euphorbiaceae	*Euphorbia cooperi*	LC	Not Endemic	
Euphorbiaceae	*Croton gratissimus*	LC	Not Endemic	
Fabaceae	*Dichrostachys cinerea*	LC	Not Endemic	
Fabaceae	*Senegalia caffra*	LC	Not Endemic	

Fabaceae	*Senegalia mellifera*	LC	Not Endemic	
Fabaceae	*Vachellia karoo*	LC	Not Endemic	
Fabaceae	*Vachellia nilotica*	LC	Not Endemic	
Fabaceae	*Vachellia robusta*	LC	Not Endemic	
Fabaceae	*Vachellia tortilis*	LC	Not Endemic	
Fabaceae	*Peltophorum africanum*	LC	Not Endemic	
Iridaceae	*Gladiolus dalenii*	LC	Not Endemic	
Lamiaceae	*Vitex zeyheri*	LC	Not Endemic	
Malvaceae	*Dombeya rotundifolia var. rotundifolia*	LC	Not Endemic	
Malvaceae	*Hermannia depressa*	LC	Not Endemic	
Moraceae	*Ficus ingens*	LC	Not Endemic	
Oxalidaceae	*Oxalis depressa*	LC	Not Endemic	
Poaceae	*Aristida congesta subsp. barbicollis*	LC	Not Endemic	
Poaceae	*Aristida stipitata subsp. graciliflora*	LC	Not Endemic	
Poaceae	*Bothriochloa insculpta*	LC	Not Endemic	
Poaceae	*Brachiaria xantholeuca*	LC	Not Endemic	
Poaceae	*Cymbopogon caesius*	LC	Not Endemic	
Poaceae	*Cynodon dactylon*	LC	Not Endemic	
Poaceae	*Eragrostis chloromelas*	LC	Not Endemic	
Poaceae	*Eragrostis curvula*	LC	Not Endemic	
Poaceae	*Eragrostis racemosa*	LC	Not Endemic	
Poaceae	*Eragrostis superba*	LC	Not Endemic	
Poaceae	*Heteropogon contortus*	LC	Not Endemic	
Poaceae	*Hyparrhenia hirta*	LC	Not Endemic	
Poaceae	*Melinis repens*	LC	Not Endemic	
Poaceae	*Panicum maximum*	LC	Not Endemic	
Poaceae	*Sporobolus africanus*	LC	Not Endemic	
Poaceae	*Themeda triandra*	LC	Not Endemic	
Poaceae	*Aristida bipartita*	LC	Not Endemic	
Poaceae	*Digitaria eriantha*	LC	Not Endemic	
Poaceae	*Pogonarthria squarrosa*	LC	Not Endemic	
Poaceae	*Cenchrus ciliaris*	LC	Not Endemic	
Poaceae	*Eragrostis rigidior*	LC	Not Endemic	
Poaceae	*Sorghum versicolor*	LC	Not Endemic	
Pteridaceae	*Pellaea calomelanos var. calomelanos*	LC	Not Endemic	

Rhamnaceae	*Berchemia zeyheri*	LC-Protected Tree	Not Endemic	
Rhamnaceae	*Ziziphus mucronata subsp. mucronata*	LC	Not Endemic	

Invasive Alien Plants (IAPs)

Eight (8) IAP species were recorded on the Development Area. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b. These IAP species must be controlled by implementing an IAP Management Programme, in compliance of Section 75 of the NEM:BA, as stated above.

Protected Tress

During the field assessment two (2) species of protected trees were observed: *Berchemia zeyheri* (Pink-Ivory) and Sclerocarya birrea subsp caffra (Marula). The protected trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). In terms of the NFA, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence. The locations of the trees recorded in the Development Area can be seen in **Figure 6.12**. The trees marked were those observed during the field assessment, it is expected that there are several more.

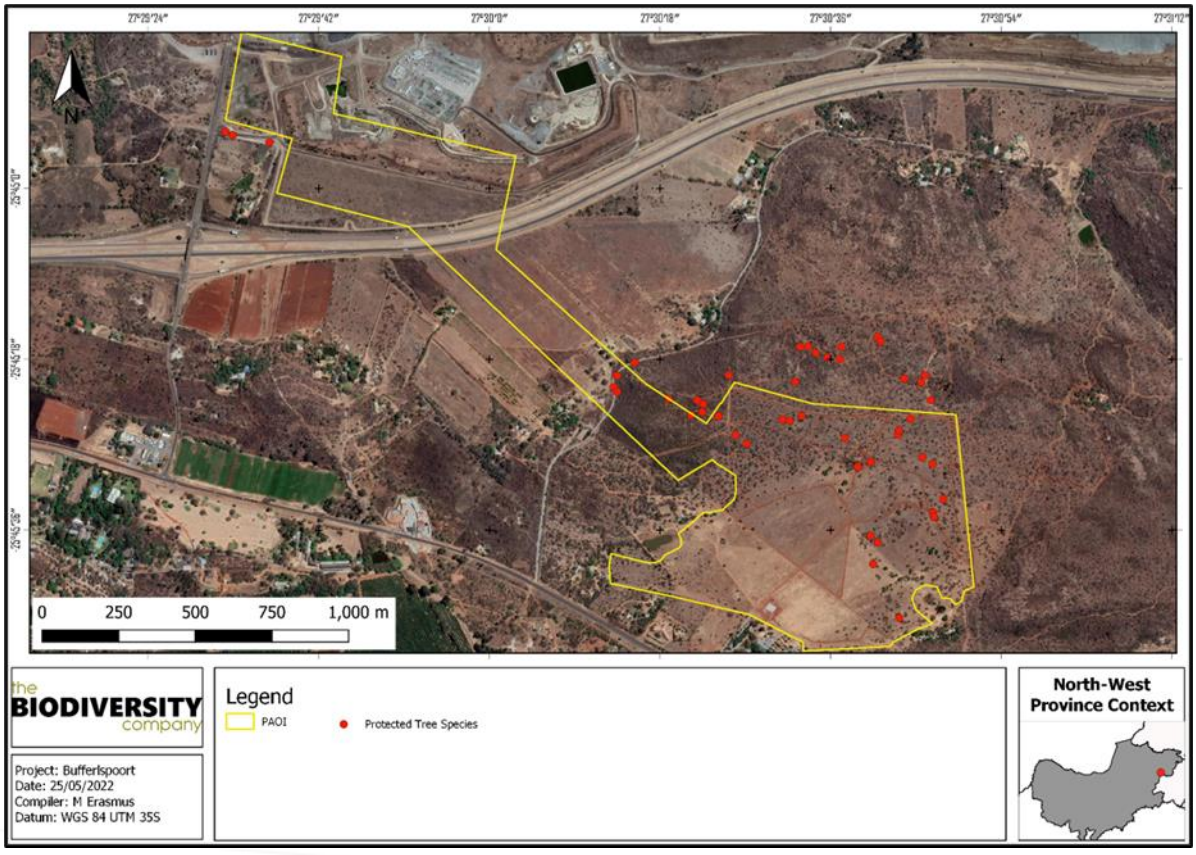


Figure 6.12: Location of protected flora species

b) Faunal Assessment

Amphibians and Reptiles

Four (4) species of reptile and no species of amphibians were recorded on the Development Area during the survey period table below. However, there is the possibility of more species being present, as certain reptile species are secretive and require long-term surveys to ensure capture. None of the species recorded are regarded as threatened.

Table Summary of herpetofauna species recorded within the PAOI.

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	Global (IUCN, 2022)
Reptiles			
Acanthocercus atricollis	Tree agama	LC	LC
Lygodactylus capensis	Cape dwarf gecko	LC	LC
Trachylepis punctatissima	Speckled Rock Skink	LC	Unlisted
Trachylepis varia	Variable Skink	LC	LC

Mammals

Ten (10) mammal species were observed in total based on either direct observation or the presence of visual tracks and signs. Five (5) of these species could naturally occur outside of protected areas/game farms ,while five (5) species are considered mainly found restricted to protected areas/game farms (managed and fences areas), as 'captive' species, in this case due current land use being a game farm, No SCC were observed.

TableSummary of mammal species recorded within the PAOI. Mammal species are considered 'captive' species as these were only present within the game farm areas, marked in green text.

Species	Common Name		Conservation Status	
			Regional (SANBI, 2016)	IUCN (2022)
Aepyceros melampus	Impala		LC	LC
Chlorocebus pygerythrus	Vervet Monkey		LC	LC
Connochaetes taurinus	Blue Wildebeest		LC	LC
Damaliscus pygargus phillipsi	Bleskbok		LC	LC
Hystrix africaeaustralis	Cape Porcupine		LC	LC
Lepus saxatilis	Scrub Hare		LC	LC
Taurotragus oryx	Eland		LC	LC
Papio ursinus	Chacma Baboon		LC	LC
Paraxerus cepapi	Tree Squirrel		LC	LC
Tragelaphus angasii	Njala		LC	LC

c) Habitat Assessment and Site Ecological Importance

The main habitat types identified across the Development Area were initially identified largely based on aerial imagery. These main habitat types were refined based on the field coverage and data collected during the survey; the delineated habitats can be seen in **Figure 6.13**. Emphasis was placed on limiting

timed meander searches within the natural habitats and therefore habitats with a higher potential of hosting SCC. Four (4) habitats were identified in the Development Area, each of the habitats identified are discussed in the sub-sections below.

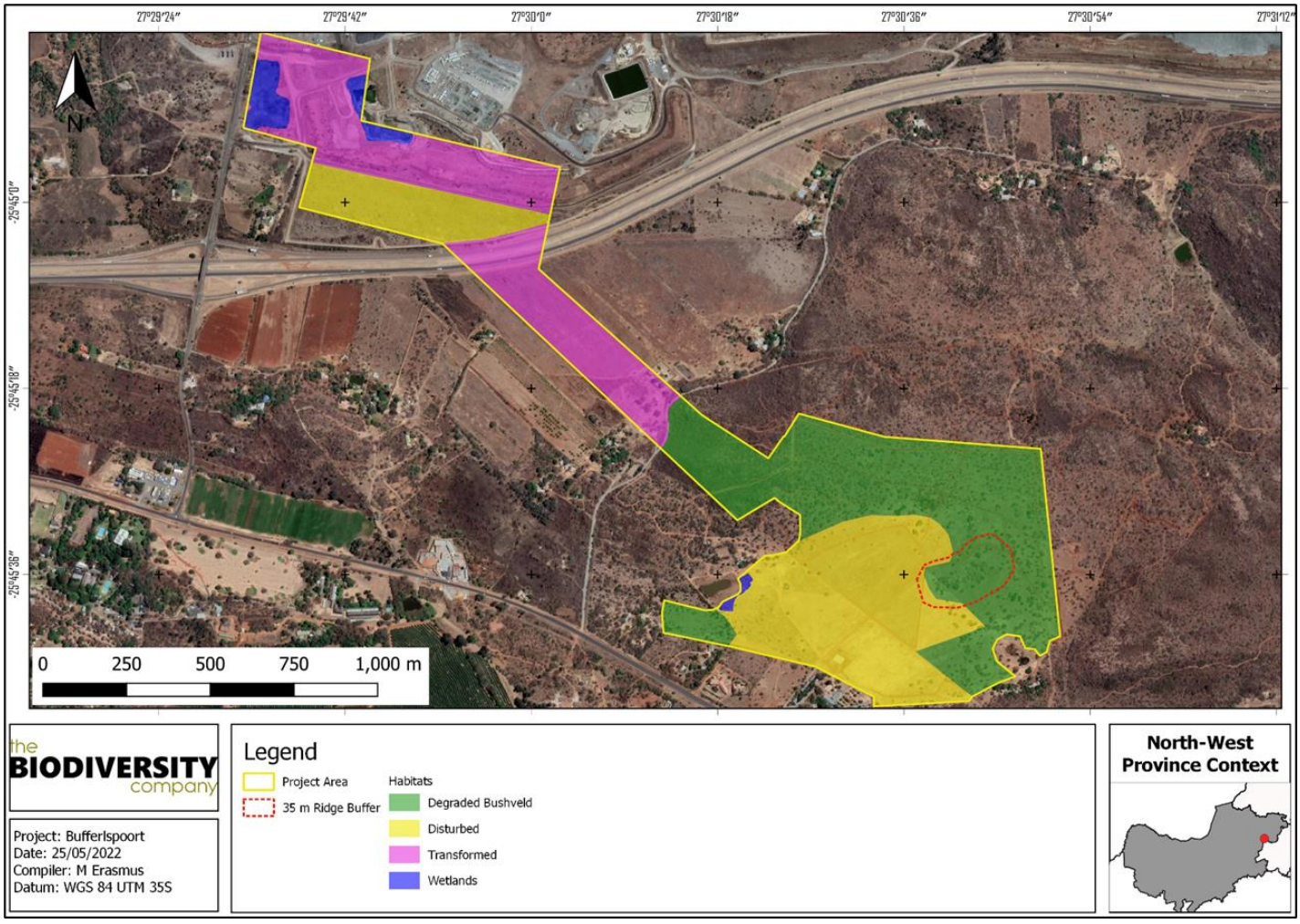


Figure 6.13: Habitats identified within the Development Area

Degraded Bushveld

This habitat type is regarded as semi-natural bushveld, but slightly disturbed due to the presence of roads, mismanagement (overgrazing) and also human infringement as it is being used as a game farm. This habitat represents typical mountain bushveld, with rocky extrusions and/or rocky boulders in certain areas, especially the portion to the northern boundary of the Development Area. The current ecological condition of this habitat regarding the main driving forces, are intact, which is evident in the amount and importance of the species recorded in the faunal assessment; and the high species diversity and number of plant species recorded. Current human infringement occurs, especially in areas close to roads, however it is limited due to the current land use being a game farm. The difference between this habitat and the disturbed bushveld is the extent of the disturbance in the disturbed bushveld being more severe.

This habitat unit can be regarded as important, not only within the local landscape, but also regionally. The unit functions as remaining greenlands which supports viable plant species populations and is also used for foraging. The unit also serves as a movement corridor for fauna within a landscape fragmented. The habitat sensitivity is regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area being more fragmented locally, which is supported by the various ecological datasets. This habitat

functions as the CBA 2 it is classified as, a viable constituent of and EN ecosystem, NPAES, IBA as well as biosphere reserve.

Disturbed Bushveld

This habitat is regarded as areas that have been impacted more by historic land clearing, mismanagement and land use. Historical vegetation clearing for what is assumed cultivation has led to an absence of large woody plants and an area dominated by grasses, with current grazing activities by game also taking place within this area. These habitats aren't entirely transformed but in a constant disturbed state, as they can't recover to a more natural state due to ongoing disturbances and impacts received from grazing and mismanagement. These areas are considered to have a low sensitivity, as they may be used as a movement corridor and in many cases form a barrier between the more degraded bushveld and the transformed areas.

Transformed

This habitat unit represents all areas of agriculture, mining areas as well as the associated secondary roads. The transformed areas have little to no remaining natural vegetation due to land transformation by mining areas, agriculture and roads. These habitats exist in a constant disturbed state as it cannot recover to a more natural state unless through human intervention.

Wetlands

Wetlands are identified in the wetland report, and include wetlands and manmade dams (TBC, 2022). Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and an important habitat for various fauna and flora.

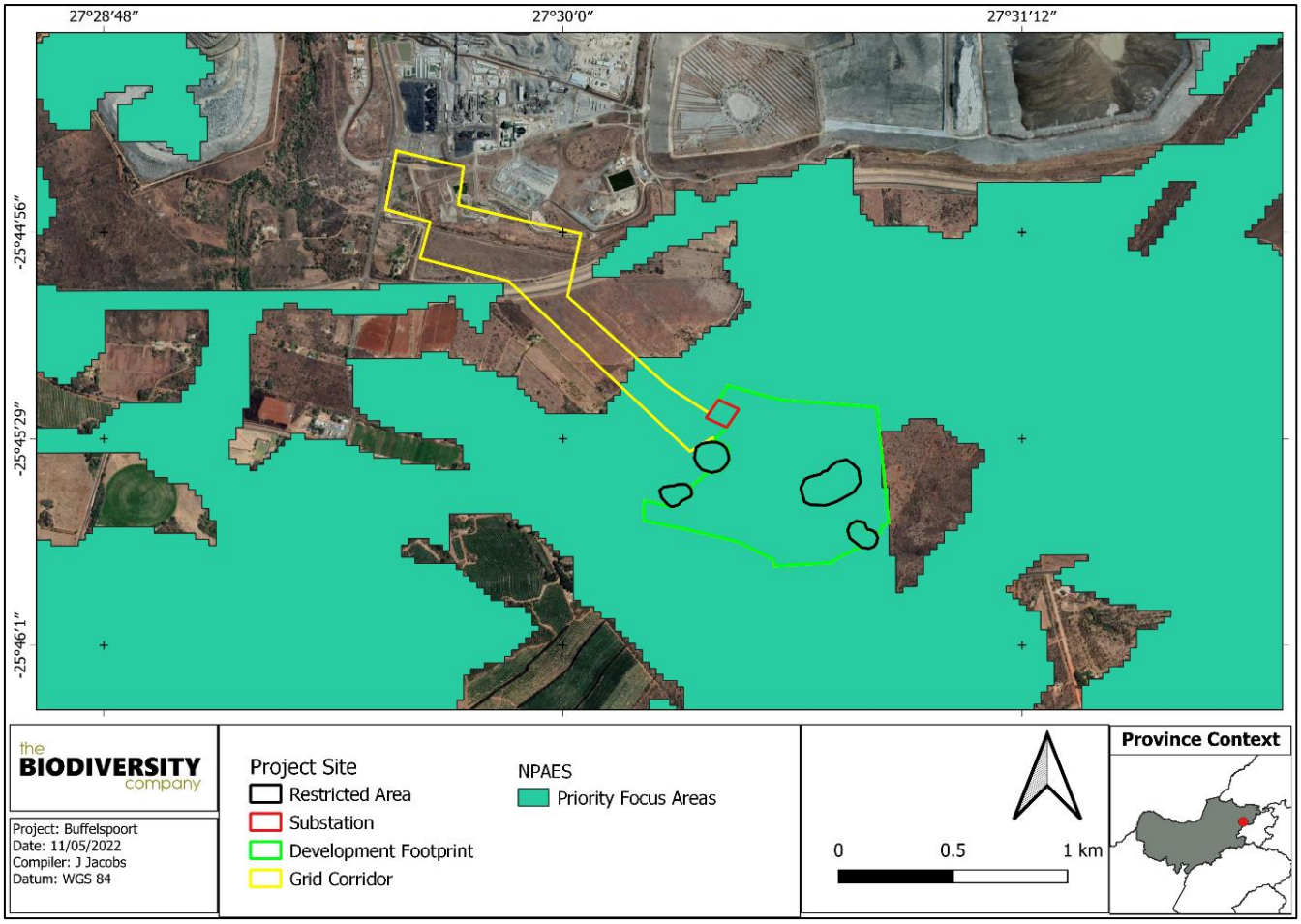


Figure 6.12: The Development Footprint and Grid Connection Corridor in relation of the NPAES Priority Focus Areas

vi. Hydrological Setting

During the site visit, four HGM units were identified within the 500 m regulated area (see **Error! Reference source not found.**). The wetland areas were delineated in accordance with the DWAF (2005) guidelines (see **Error! Reference source not found.** and **Error! Reference source not found.**). Two HGM units have been identified as depression wetlands, one has been identified as a hillslope seep wetland and one as a unchannelled valley bottom wetland. Along with the wetlands multiple drainage features as well as artificial wetlands and a few dams were also delineated. Although these systems do not classify as a natural wetland system it is important to note where they are and to preserve them.

Ecological Functional Assessment

The ecosystem services provided by the wetland units identified on site were assessed and rated using the WET-EcoServices method (Kotze *et al.,* 2008). HGM units 1 & 2 scored "Moderately High" ecosystem service scores with HGM 3 scoring "Moderately Low" and HGM 4 "Intermediate" ecosystem services scores respectively. The average ecosystem service scores for the delineated systems are illustrated in Table 0-4 and **Error! Reference source not found.**.

Ecosystem services contributing to these scores include flood attenuation, streamflow regulation, sediment trapping, phosphate assimilation, nitrate assimilation, toxicant assimilation, erosion control, biodiversity maintenance and tourism and recreation.

Table 0-4 Average ecosystem service scores for delineated wetlands

Moderately High	Intermediate	Moderately Low
HGM 1	HGM 4	HGM 3
HGM 2		

HGM 1 & 2 scored a higher ecosystem services score than the rest of the wetlands due to the high volumes of hydrophyte vegetation in and around the two wetlands. The vegetation plays a very important role in biodiversity maintenance and the assimilation of toxicants as well as phosphate and nitrates from the environments as well as erosion control and sediment trapping. HGM 1 is located at the bottom of a slope where sediment will flow to during the raining season. The HGM will then prevent the loss of sediment as well as prevent erosion from occurring. HGM 2 is located close to an active mine where toxicants and pollution flows into the HGM unit through overland flows during rain. The HGM unit then acts as a sink to contain the toxicants and prevent the toxicants from reaching the river systems. The HGM unit then uses its vegetation to remove the toxicants from the environment.

HGM 3 scored the lowest ecosystem services score due to its location as well as the wetland type. The wetland is located on a hillslope within agricultural fields. The agricultural field means that the wetland is stripped from all hydrophyte vegetation which limits its ability to contribute to biodiversity maintenance and to provide habitat for species. The wetland does however provide water for some crops that grows within the wetland.

HGM 4 scored "Intermediate" ecosystem services scores due to the presence of hydrophyte vegetation which contributes to biodiversity maintenance and provides habitat and resources. The wetland however is located within the more natural areas of the regulated area away from most of the pollution and toxicants. The wetland thus does not play an important role in the assimilation of pollutants and toxicants out of the environment.

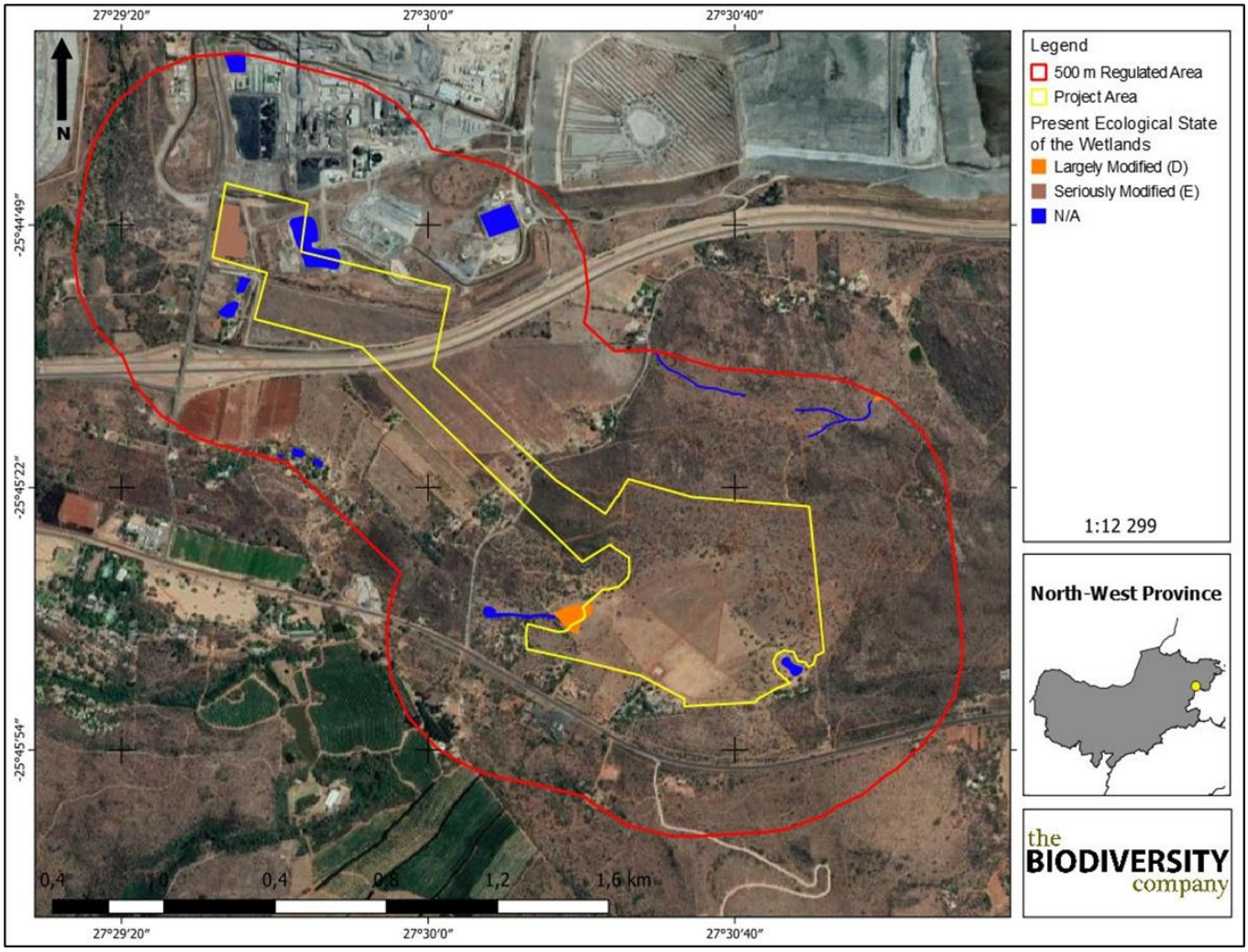


Figure 6.13: Map illustrating present ecological state of delineated wetland.

vii. Terrestrial Fauna Communities

Mammals

The International Union for Conservation of Nature (IUCN) Red List Spatial Data lists 86 mammal species that could be expected to occur within the Development Footprint. This list excludes large mammal species that are normally restricted to protected areas. Thirteen (13) of these expected species are regarded as threatened (refer to **Table 6.7**). Of these 13 SCCs, nine (9) have a low likelihood of occurrence based on the lack of suitable habitat in the Development Footprint.

Table 6.7: Threatened mammal species that are expected to occur within the Development Area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Aonyx capensis	Cape Clawless Otter	NT	NT	Low
Atelerix frontalis	South African Hedgehog	NT	LC	Moderate
Cloeotis percivali	Short-eared Trident Bat	EN	LC	Low
Crocidura mariquensis	Swamp Musk Shrew	NT	LC	Low
Eidolon helvum	African Straw-colored Fruit Bat	LC	NT	Low

Felis nigripes	Black-footed Cat	VU	VU	Moderate
Hydrictis maculicollis	Spotted-necked Otter	VU	NT	Low
Mystromys albicaudatus	White-tailed Rat	VU	EN	Low
Ourebia ourebi	Oribi	EN	LC	Low
Panthera pardus	Leopard	VU	VU	High
Parahyaena brunnea	Brown Hyaena	NT	NT	Moderate
Pelea capreolus	Grey Rhebok	NT	LC	Low
Redunca fulvorufula	Mountain Reedbuck	EN	LC	Low

Amphibians

Based on the International Union for Conservation of Nature (IUCN) Red List Spatial Data and FrogMap, 22 amphibian species are expected to occur within the Development Footprint. No amphibian SCCs are expected to occur within the Development Footprint.

Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, 66 reptile species are expected to occur within the Development Footprint. One (1) species is regarded as threatened (refer to **Table 6.8**).

Table 6.8: Threatened reptile species that are expected to occur within the development area

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Kinixys lobatsiana	Lobatse Hinged Tortoise	VU	VU	Moderate

viii. Avifauna

The field survey was undertaken on the 30th of May 2022 by The Biodiversity Company.

Important Bird and Biodiversity Areas

Important Bird & Biodiversity Areas (IBAs) are sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity.

According to Birdlife South Africa (2017), the selection of IBAs is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels.

The Magaliesberg IBA was previously known as the Magaliesberg and Witwatersberg IBA, and consists mainly of the Magaliesberg range which extends from the North West of Rustenburg in the West to the N1 in the East near Pretoria (Birdlife South Africa, 2015). Several large rivers have their headwaters in these mountains, such as the Crocodile, Sterkstroom, Magalies and Skeerpoort rivers (Birdlife South Africa, 2015). Three (3) major impoundments have been built along the Magaliesberg, namely the Hartbeespoort Dam in the East, Buffelspoort Dam in the centre and Olifantsnek Dam about 7 km south of Rustenburg (Birdlife South Africa, 2015).

IBA trigger species in the Magaliesberg IBA include two globally threatened species, namely Cape Vulture (Gyps coprotheres) and Secretarybird (Sagittarius serpentarius), of which the former is considered to be the most important (Birdlife South Africa, 2015). Regionally threatened species include the Lanner Falcon (Falco biarmicus), Half-collared Kingfisher (Alcedo semitorquata), African Grass Owl (Tyto capensis), African Finfoot (Podica senegalensis) and Verreaux's Eagle (Aquila verreauxii) (Birdlife South Africa, 2015). Biome-restricted species include the White-bellied Sunbird (Cinnyris talatala), Kurrichane Thrush (Turdus libonyanus), White-throated Robin-chat (Cossypha humeralis), Kalahari Scrub Robin (Erythropygia paena) and Barred Wren-Warbler (Calamonastes fasciolatus) (Birdlife South Africa, 2015).

The Project Site overlaps with the Magaliesberg Biosphere Reserve (refer to **Figure 6.15**) with the Development Area encroaching into areas designated as a Buffer Zone and the grid corridor extending into the Transition Area.

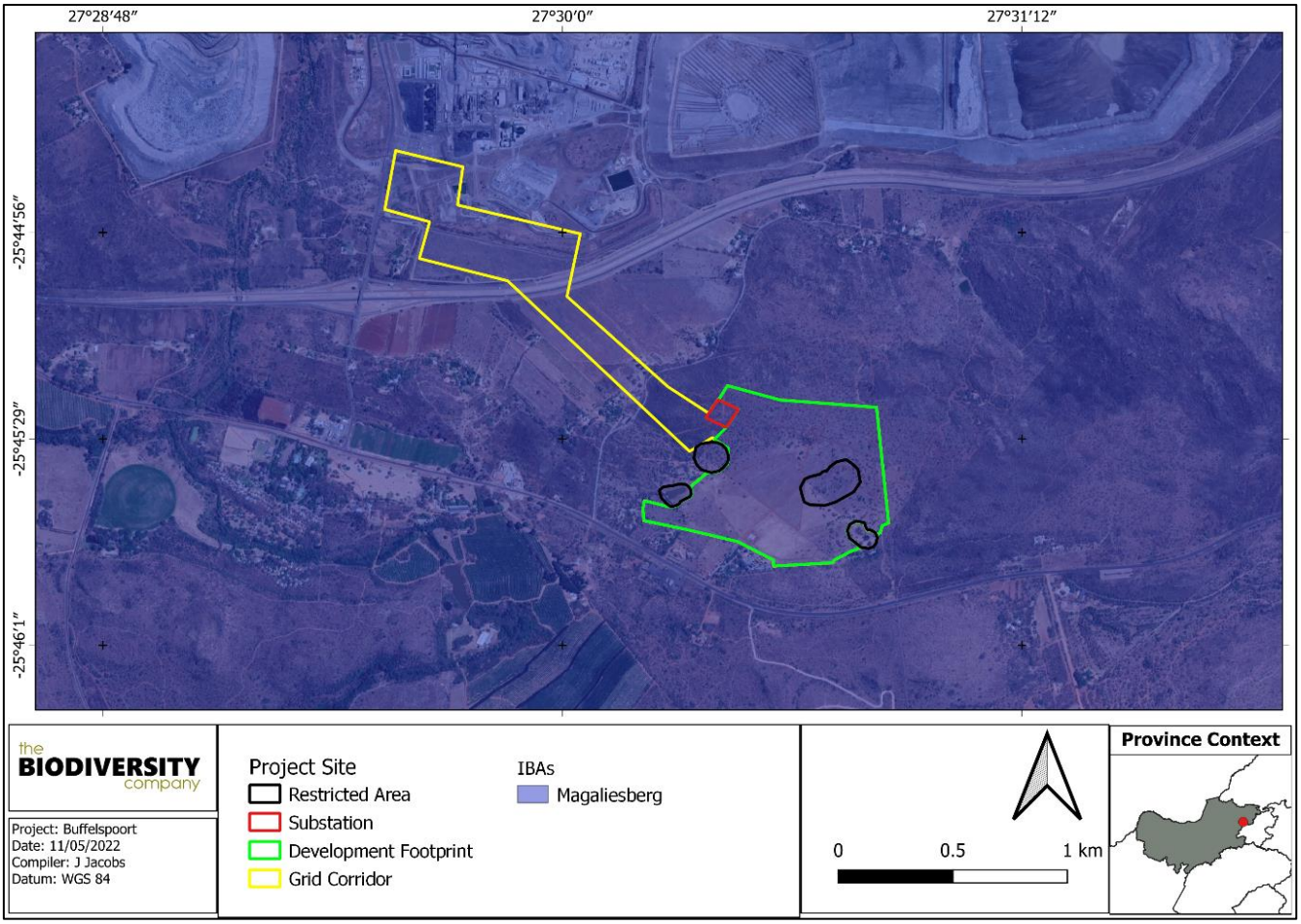


Figure 6.15: The Development Footprint and Grid Connection Corridor in relation to the Magaliesburg IBA

Avifauna Species Expected to Occur within the area

Fifty-seven (57) bird species were recorded in the point counts of the survey, while 36 species were recorded during incidental observations.

Table 6.9: Dominant avifaunal species within the Development Footprint during the survey as defined as those species whose relative abundances cumulatively account for more than 77% of the overall abundance shown alongside the frequency with which a species was detected among point counts

Scientific Name	Common Name	Regional Threat status	International Threat status	Relative abundance	Frequency (%)
Pycnonotus tricolor	Bulbul, Dark-capped	Unlisted	Unlisted	0,151	0,913
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC	0,081	0,696
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC	0,064	0,130
Crinifer concolor	Go-away-bird, Grey	Unlisted	LC	0,057	0,522
Turdoides jardineii	Babbler, Arrow-marked	Unlisted	LC	0,050	0,130
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC	0,044	0,174
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC	0,037	0,435

Estrilda astrild	Waxbill, Common	Unlisted	LC	0,034	0,217
Uraeginthus angolensis	Waxbill, Blue	Unlisted	LC	0,030	0,217
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC	0,027	0,174
Quelea quelea	Quelea, Red-billed	Unlisted	LC	0,027	0,043
Emberiza flaviventris	Bunting, Golden-breasted	Unlisted	LC	0,023	0,130
Crithagra mozambica	Canary, Yellow-fronted	Unlisted	LC	0,023	0,174
Dendroperdix sephaena	Francolin, Crested	Unlisted	LC	0,020	0,087
Colius striatus	Mousebird, Speckled	Unlisted	LC	0,020	0,087
Spilopelia senegalensis	Dove, Laughing	Unlisted	LC	0,017	0,174
Lophoceros nasutus	Hornbill, African Grey	Unlisted	LC	0,017	0,174
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC	0,017	0,043
Urocolius indicus	Mousebird, Red-faced	Unlisted	LC	0,017	0,043
Chalcomitra amethystina	Sunbird, Amethyst	Unlisted	LC	0,017	0,087

6.5. Heritage (including Archaeology and Palaeontology)

Fieldwork was conducted as part of the Heritage Impact Assessment on 28 April, 06 May, and 26 May 2022 by a field team from PGS Heritage. The fieldwork component of the study was aimed at identifying tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of intensive walkthroughs of the proposed Development Area and Grid Connection Corridor.

6.5.1. Identified Heritage Resources

During the fieldwork, a total of seven (7) heritage features and resources were identified (Figure 33). These consist of one (1) burial ground with approximately 100 graves (BFP-02), three (3) localities with recent historic structures (BFP-04, BFP-06, and BFP-07), and one (1) kraal (BFP-05), two (2) archaeological sites (BFP-01 and BFP-03) were identified.

Archaeological Resources

The two archaeological sites identified, are characterised by large areas of stone walling (BFP-01 and BFP-03). Site BFP-01 consists of a long continuous stone wall running along a raised outcrop, although no other cultural material was identified within the proposed Development Footprint. The developer has excluded this site employing buffers put in place for the layout of the solar energy facility. Site BFP-03 is a large stone wall site with numerous stone-walled enclosures. It appears the area was already disturbed as it now functions as a feeding ground for the game in the area. There is evidence of some of the stone walling being destroyed whereas others still appear to be in their original state, no other cultural material was identified in the area. It is located just outside (at the north-eastern corner) of the proposed Development Footprint.

The possibility of the archaeological resources impacted by the proposed Buffelspoort Solar PV Energy Facility and OHL Grid Corridor cannot be excluded, and the Project can potentially have a HIGH impact without and LOW with mitigation.

Burial Grounds and Graves

A single burial ground consisting of approximately 100 graves was identified at site BFP-02. The site was indicated to the fieldwork team by the owner of the property. The informal graveyard lies just outside (west) the proposed Development Area. Although the area is overgrown by vegetation, some of the graves are still identifiable and consist mainly of stone-packed or stone-lined grave dressings, except for a few concrete or marble grave dressing features. Due to the cultural and religious significance of burial grounds, the site is graded as Grade IIIA.

The possibility of the burial ground being impacted by the proposed Buffelspoort Solar PV Energy Facility and OHL Grid Corridor cannot be excluded, and the Project can potentially have a HIGH impact without mitigation. Implementation of the recommended management and mitigation measures can reduce the impact rating to LOW.

Historical Structures

The recent historic structures (BFP-04, BFP-06, and BFP-07) and the kraal (BFP-05) are all younger than 60 years and vary in preservation. They are all currently abandoned. The structures and remains of structures are not conservation worthy and contain no cultural or scientific value and are consequently graded as not conservation worthy (NCW).

The impact on the recent historic structures identified during the fieldwork can potentially have a LOW significance before and after the implementation of the proposed mitigation measures.

The locations of the heritage resources identified during the field survey are shown in **Figure 6.16**, and the descriptions of each individual site, including pictures of the sites, are provided in **Table 6.10**.

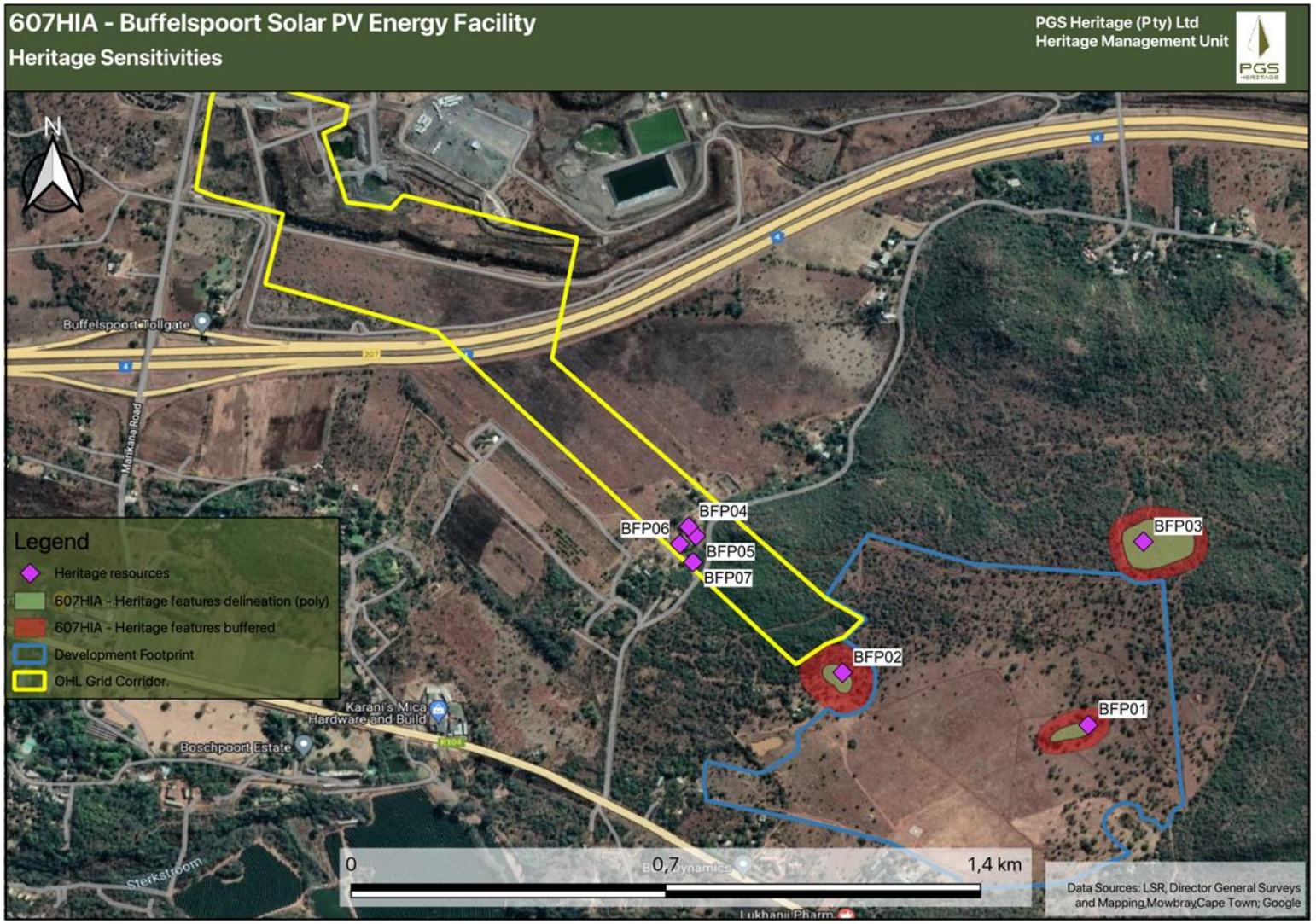


Figure 6.16: Identified heritage resources within the Development Area and Grid Connection Corridor

Table 6.10: Sites identified during the heritage survey

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
BFP-01	S -25.759900°	E 27.512075°	A continuous stone wall (drywalling) is located on a small outcrop within the proposed Development Footprint. It runs across the centre of the small, raised outcrop. No other material of cultural significance was identified within the site area. *The new planned layout has excluded this site from the proposed Development Footprint.* **Site extent:** Approximately 60m x 30m. It is recommended that: » A 30-meter buffer should be implemented from the outer edge of the archaeological site. » If the preservation of the site is not possible mitigation before destruction will be required. o Phase 2 archaeological mitigation process must be implemented. This will include, surface collections, test excavations and analysis of recovered material. A permit issued under S35 of the NHRA will be required to conduct such work. o On completion of the mitigation work, the developer can apply for a destruction permit with the backing of the mitigation report. » This work will need to be done as part of the EMPr implementation before construction.	LOW	IIIC

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
BFP-02	S 25.755680°	E 27.511230°	An informal burial ground with approximately 100 graves is located just outside the Development Footprint. The graves are in a very overgrown field and as such, some of the graves can easily be missed. Most of the graves have a stone-packed and/or stone-lined dressing, whereas others have concrete or granite dressing. **Site extent:** Approximately 50m x 50m. Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a HIGH heritage significance with a heritage rating of IIIA. All graves have high levels of emotional, religious and in some cases historical significance. It is also important to understand that the identified graves could have significant heritage value to the relevant families. It is recommended that: » The Development footprint incorporated the recommended 50-meter no-go-buffer zone The graves will be avoided and left in situ. » A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). » If the site is going to be impacted directly and the graves need to be removed, a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.	High	IIIA

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
					
BFP-03	S -25.755832°	E 27.513298°	A large stone-walled site is located here but it appears that it has already been disturbed by activities. The area is currently being used as a feeding ground for the game located on the property. The new planned layout has excluded this site from the proposed Development Footprint. Some of the stonewalling appear to be in its original state, whereas others have been pushed over and heaps created to clear a space for the game. At the centre of one stone enclosure, a modern braai area has been built with bricks. No other cultural material was identified at the site. Site extent: Approximately 30m x 30m. It is recommended that: » If the preservation of the site is not possible mitigation before destruction will be required. » Phase 2 archaeological mitigation process must be implemented. This will include, surface collections, test excavations and analysis of recovered material. A permit issued under s35 of the NHRA will be required to conduct such work. » On completion of the mitigation work, the developer can apply for a destruction permit with the backing of the mitigation report.	Moderate	IIIB

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
			» This work will need to be done as part of the EMP implementation before construction.		
					
BFP-04	S -25.755504°	E 27.503211°	Large abandoned and broken-down structure located in an open field, within the OHL Grid Corridor area. Along with the large structure, there is a small broken-down red-brick building located to the left of the structure and a small square concrete and a possible reservoir located to the right of the structure. The large structure consists of bricks and concrete and had wooden window frames along with a corrugated iron roof. The structure has multiple rooms and probably served the purpose of residential space. The structure appears to be relatively modern as it does not yet appear on the first edition topographical maps that date to 1968. **Site extent:** Approximately 25m x 25m. It is recommended that: » No mitigation is required.	NCW	No research potential or other cultural significance

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
					
BFP-05	S -25.755708°	E 27.503372°	A kraal that possibly once served the purpose to keep animals, like domestic stock. The kraal could also be associated with the large residential structure at the site at BFP-04. This kraal is located within the OHL Grid Corridor area. Site extent: Approximately 10m x 10m. It is recommended that: » No mitigation is required.	NCW	No research potential or other cultural significance
					

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
BFP-06	S -25.755888°	E 27.503019°	Large abandoned and broken-down structure located in an open field, within the OHL Grid Corridor area. The structure consists of brick and concrete. There is no evidence left of a roof. At the corner of the building, there is a space that resembles an entryway and the remains of a few stairs. This building could probably have been a storage unit of some sort. The structure appears to be relatively modern as it does not yet appear on the first edition topographical maps that date to 1968. **Site extent:** Approximately 10m x 10m. It is recommended that: » No mitigation is required.	NCW	No research potential or other cultural significance
					
BFP-07	S -25.755832°	E 27.513298°	An abandoned and broken-down structure is located behind site BFP-06, which is located within the OHL Grid Corridor area. It appears to be the same building materials, bricks, and concrete. The structure has no remains of a roof, or doors and windows. The structure appears to be relatively modern as it does not yet appear on the first edition topographical maps that date to 1968.	NCW	No research potential or other cultural significance

Site No.	Lat	Long	Description	Heritage Significance	Heritage Rating
			Site extent: Approximately 5m x 5m. It is recommended that: » No mitigation is required.		
					

6.5.2. Palaeontology

According to the SAHRIS PalaeoMap, the palaeontological sensitivity of the Development Footprint and grid connection corridor is zero or insignificant. No paleontological studies are required (**Error! Reference source not found.**refer to **Figure 6.17**).

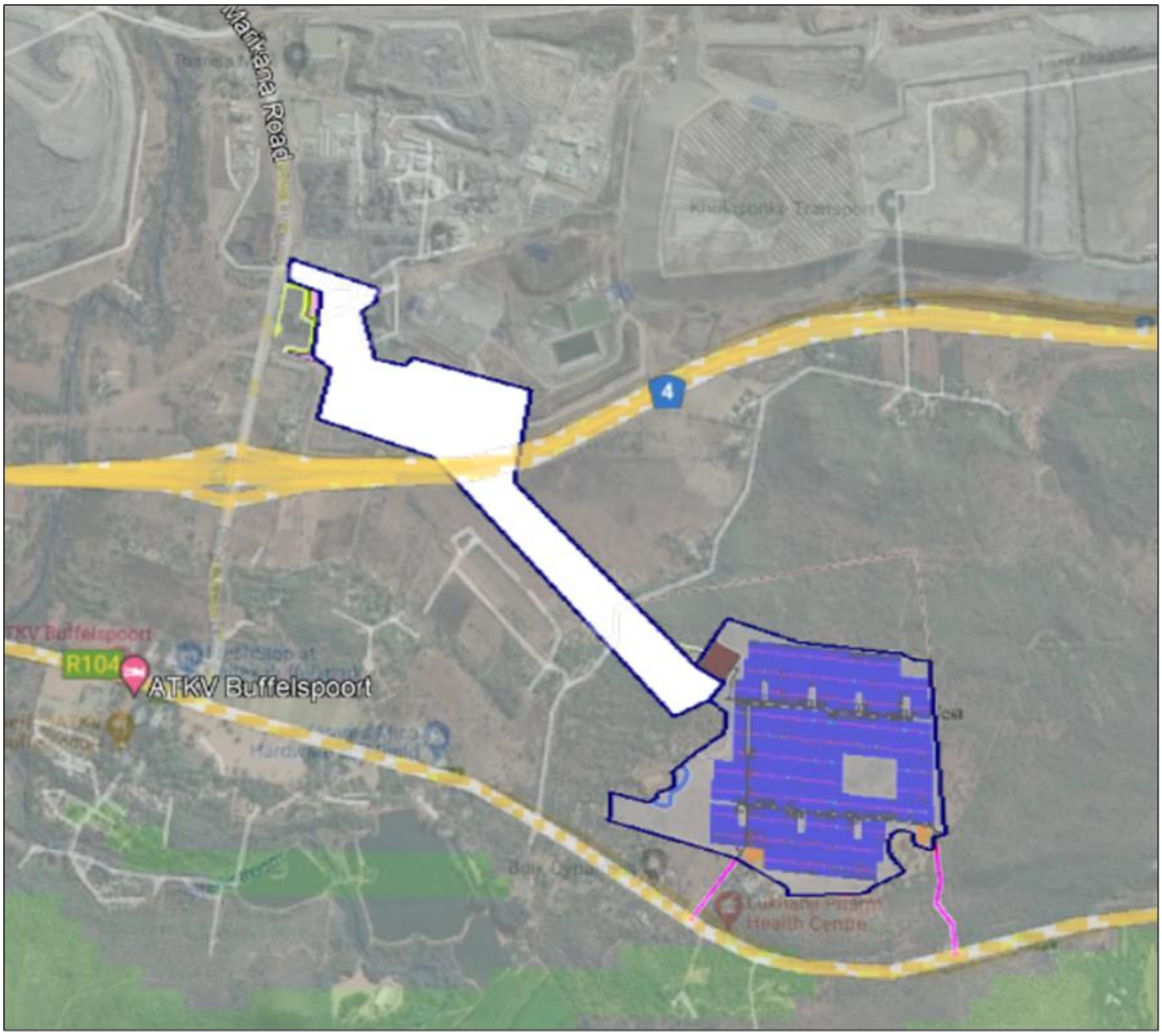


Figure 6.17: Palaeontological Heritage Sensitivity map. As can be viewed, most of the area has no sensitivity indicated by the white/clear background (Retrieved from SAHRIS).

6.6 Visual Quality

The largest residential area, or town, near the Development Area is the mining town of Mooinooi (population 4 733), located approximately 6km east of the Development Area.

The N4 Bakwena National Road provides motorised access to the region and is the main connecting route in between the Gauteng Province (Pretoria) and Rustenburg. The proposed Project Site is easily accessible from the N4 via the R104 Old Rustenburg arterial road.

Besides the large number of mines and mining infrastructure within the area, there are numerous power lines and substations, predominantly associated with the mines. Some of these include: Bighorn / Pluto 1 275kV, Lonmin Eastern Platinum Mine Middelkraal M/P 1, Middelkraal / Spruitfontein 1 88kV, Middelkraal / Tharisa 1

88kV, Tharisa / Spruitfontein 1 88kV, Tharisa / Tharissa Minerals MP1 88kV, Bighorn / CCT Smelters 1 and 2 88kV, Bighorn / Middelkraal 1 88kV, Middelkraal / Modderspruit 88kV, and Middelkraal / Wonderkop 1 88kV. There are no airports or airfields within the Development Area.

The area is not considered to be an "end destination" tourist attraction, but does provide a thoroughfare to tourist attractions to the west of the province, e.g. Sun City. However, one holiday resort, the Afrikaanse Taal en Kultuur Vereniging (ATKV) Buffelspoort holiday resort, was identified approximately 2 km west of the Study Area. Another facility, the Bosveld Paradys Bed and Breakfast, is located on the farm earmarked for the Project. Other than these facilities, there are no formally protected or conservation areas within the Study Area and no additional tourist attractions were identified in closer proximity to the Project Site.

View of the proposed Project Site from the N4 national road

Bushland and woodland with mountains in the background

Typical mining activities within the area near the Project Site

Mine dumps, power lines and mining infrastructure within the area near the Project Site

Figure 6.18: Photographs showing the general environment within the Study Area.

6.6.1 Potential Visual Exposure

The result of the viewshed analysis for the proposed facility is shown on the maps below (**Figure 6.19 and 6.20**). The viewshed analysis was undertaken from a representative number of vantage points within the development footprint at an offset of 3 meter above ground level for the PV panels and 15m above ground level for the overhead powerline. This was done in order to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels, inverters, BESS, powerline etc.) associated with the facility.

Figure 6.19 and 6.20 also indicates proximity radii from the development footprint in order to show the viewing distance (scale of observation) of the facility in relation to its surrounds.

The viewshed analysis includes the effect of vegetation cover and existing structures on the exposure of the proposed infrastructure.

Results

The proposed Solar PV Energy Facility is located north of a group of ridges/mountains that greatly restricts the visual exposure to the south and south-east. Visual exposure to the north-east is similarly restricted by a weak ridgeline and the Slangkop hill (and another unnamed hill), located to the north-east. Some scattered visual exposure to the west (towards Mooinooi) may be possible but is unlikely to expose the entire facility.

The most prominent visual exposure will be towards the north and the west. The northern visual exposure falls virtually entirely within mining land. Visual exposure to the west is likely to contain the most potential sensitive visual receptors in the form of residents of homesteads in that area and observers travelling along the N4 national and R104 arterial roads.

The proposed powerline will potentially be visible within a core area around the alignment itself. The northern visual exposure falls virtually entirely within mining land, while the most sensitive visual receptors will be Buffelspoort homestead and a section of the N4 Bakwena National Highway where the powerline will traverse directly overhead.

The following is evident from the viewshed analyses:

0 – 1km

The Buffelspoort Solar PV facility may be highly visible within a 1 km radius. This zone predominantly falls within vacant open space but does contain farm residences (especially to the west and north) and sections of the N4 Bakwena National Highway and R104 Old Rustenburg arterial road. It is expected that the Solar PV Energy Facility and ancillary infrastructure would be highly visible unless the observer is shielded by vegetation cover.

It should be noted that some land parcels surrounding the project site have been acquired by the Applicant thereby reducing the visibility on affected farm residences.

1 – 3km

Visual exposure within this zone includes farm residences and sections of the N4 Bakwena National Highway and R104 Old Rustenburg arterial road to the west. Visual exposure to the north falls within mining land with existing visual clutter and disturbances. The ATKV Buffelspoort holiday resort falls within this zone and may theoretically be exposed to the Buffelspoort Solar PV Energy Facility. It should once again be noted that visual exposure may only occur where the natural or planted vegetation cover is removed. Large visually screened areas can be found to the east, south east and south.

3 - 6km

Within a 3 – 6km radius, the visual exposure, predominantly to the north and west, is scattered and interrupted due to the undulating nature of the topography. Most of the visual exposure will be within mining or vacant agricultural land.

> 6km

At distances exceeding 6km, the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (Buffelspoort Solar PV Energy Facility) and the observer, and the developed nature of the study area.

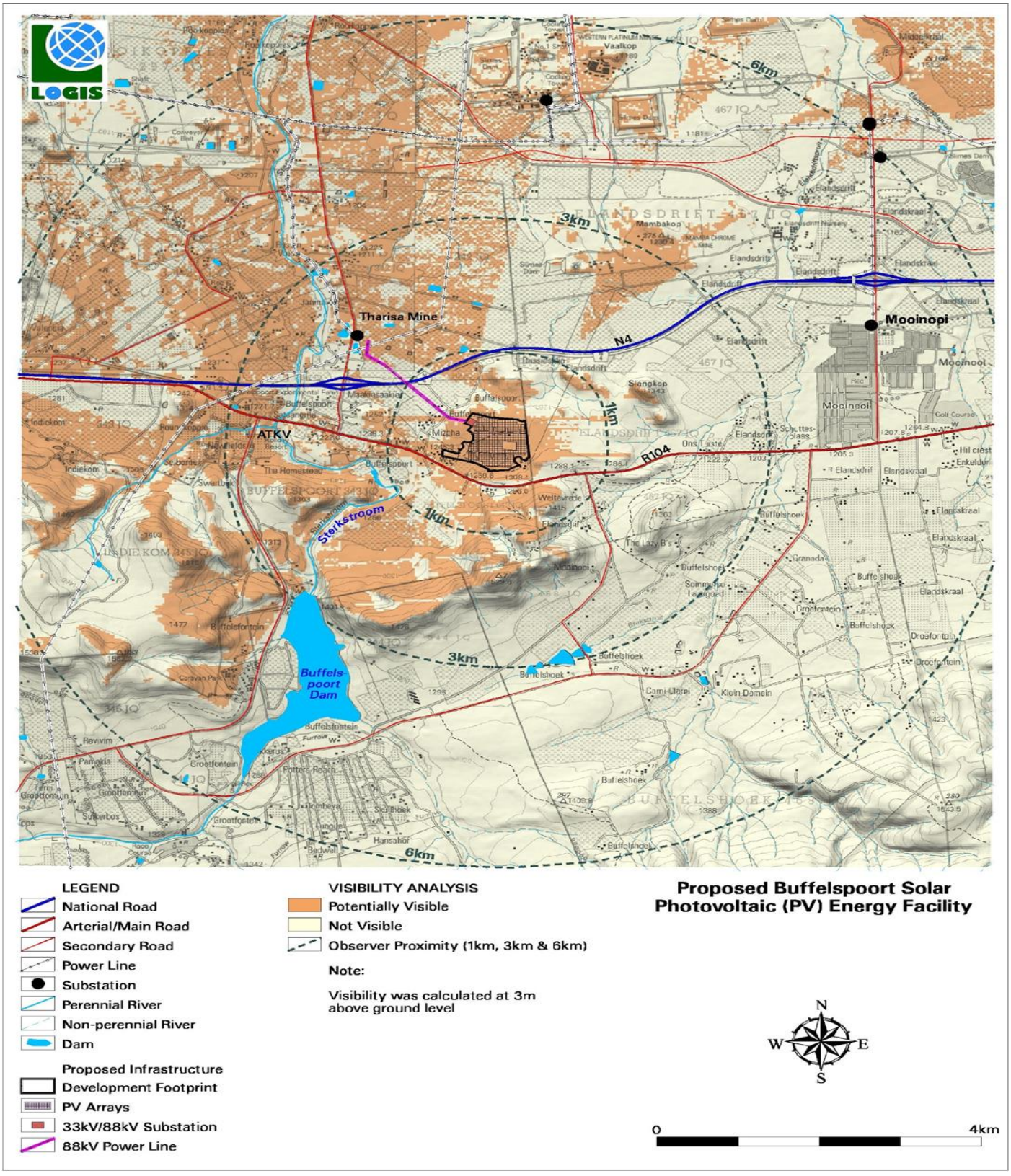


Figure 6.19: Viewshed analysis of the proposed Buffelspoort Solar PV Energy Facility

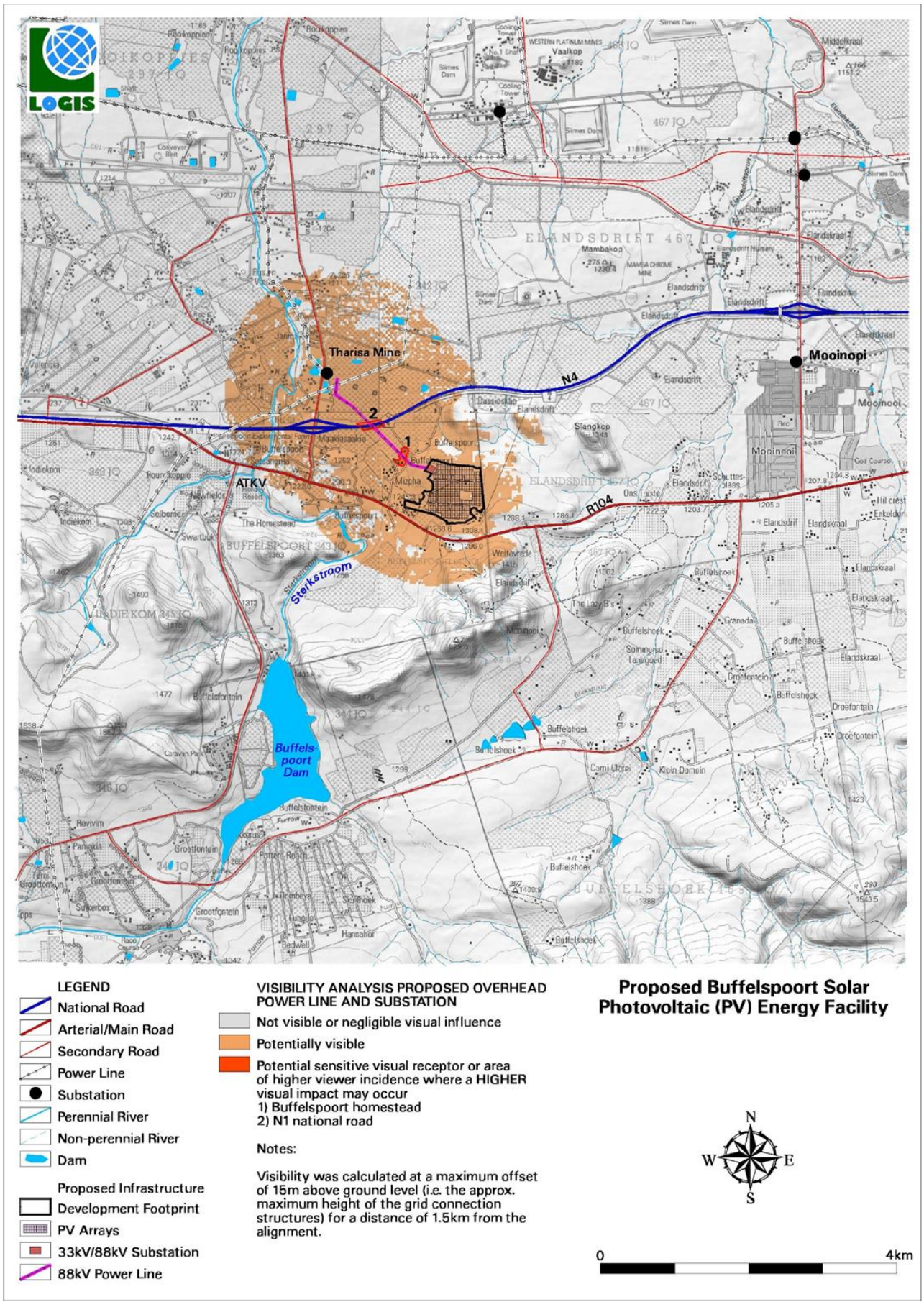

LOGIS
Tharisa Mine
Mooinooi
N4
R104
ATKV
Buffelspoort Dam
Stjerkstroom
1
2
LEGEND
National Road
Arterial/Main Road
Secondary Road
Power Line
Substation
Perennial River
Non-perennial River
Dam
Proposed Infrastructure
Development Footprint
PV Arrays
33kV/88kV Substation
88kV Power Line
VISIBILITY ANALYSIS PROPOSED OVERHEAD POWER LINE AND SUBSTATION
Not visible or negligible visual influence
Potentially visible
Potential sensitive visual receptor or area of higher viewer incidence where a HIGHER visual impact may occur
1) Buffelspoort homestead
2) N1 national road
Notes:
Visibility was calculated at a maximum offset of 15m above ground level (i.e. the approx. maximum height of the grid connection structures) for a distance of 1.5km from the alignment.
Proposed Buffelspoort Solar Photovoltaic (PV) Energy Facility
N
W
E
S
0
4km

Figure 6.20: Viewshed analysis of the proposed Buffelspoort Grid connection

6.7 Social Profile

Table 6.11 provides a baseline summary of the socio-economic profile of the Rustenburg Local Municipality (RLM) within which the proposed Project is located. In order to provide context against which the Local Municipality's socio-economic profile can be compared, the socio-economic profiles of the BPDM, North West Province, and South Africa as a whole have also been considered. The data presented in this section has been derived from the 2011 Census, the Local Government Handbook South Africa 2019, the North West Provincial Spatial Development Framework (PSDF), and the BPDM and RLM IDPs.

Table 6.11: Baseline description of the socio-economic characteristics of the area within which the Project is proposed

Location characteristics
» The Project is proposed within the North West Province.
» The Project is proposed within the Rustenburg Local Municipality of the BPDM.
» The RLM is approximately 3 422.8km² in extent.
Population characteristics
» In 2016, the RLM had a population of 626 522 people which makes up about two-fifths of the number of people in the BPDM (1 657 149).
» In terms of race groups, Black Africans made up 93.1% of the population on the RLM, followed by Whites, 6.1% and Coloureds, 0.6%. The main first language spoken in the RLM and was Setswana, 63.9% followed by Isixhosa (10.1%) and Afrikaans (5.6%).
Economic, education and household characteristics
» The dependency ratios for the RLM in 2016 was 58.7%.
» This is a relatively low dependency ratio compared to other local municipalities which reflects the employment and economic opportunities associated with the mining sector in the area.
» The GDP of the RLM was R 72.9 billion in 2020 (up from R 37.4 billion in 2010). This made up 47.04% of the total GDP of the BPDM in 2020, an increase from 43.74% in 2010.
» In terms of the North West economy, the RLM contributed 24.65% to the GDP of North-West Province in in 2020.
» The RLM is a key contributor to both the District and provincial economy.
» The primary sectors, specifically mining, contributed 77.2% towards the GVA of the RLM in 2020
» Based on the data from the 2011 Census, 17.6% of the households in the RLM had no formal income, 2.8% earned less than R 4 800, 4.2% earned between R 5 000 and R 10 000 per annum, 11.2% between R 10 000 and R 20 000 per annum and 17.4% between R 20 000 and R 40 000 per annum.
» The official unemployment rate in the RLM in 2016 was 17.7%, while 49.2% were employed, and 30.3% were regarded as not economically active.
» The unemployment rates for the RLM are lower than the Provincial rate of 17.1% and the District rate of 18.8%.
» In terms of education levels, the percentage of the population over 20 years of age in the RLM with no schooling was 4.8% (2016), compared to 8.7% and 5.5% for the North West Province and BPDM in 2016 respectively.
Services
» Based on 2016 survey, 84.6% of households in the RLM had access to electricity, while 11.2% had no access to electricity. Of the households that had access to electricity, 76.7% had in house pre-paid meters, and 7.9% had conventional meters.
» Based on the 2016 survey information, 95.2% of households in the RLM were supplied by a local or regional service provider, while 4.8% relied on their own sources.
» Of the households supplied by service providers, 54.5% had piped water in their yards and 31% had piped water in their houses, while 9.3% relied on community stands or public taps.
» The relatively low number of households with piped water in their houses reflects the high percentage of informal housing units (29%) in the RLM.

- 59.3% of the households in the RLM had access to flushing toilets (2016), while 36.1% relied on pit latrines and 1.9% did not have access to formal sanitation.
- 72.6% of the households in the RLM had access to regular refuse removal service, while 12.2% disposed of their waste at their own dumping site and 4.4% had no access to refuse services (2016).

CHAPTER 7: ASSESSMENT OF IMPACTS

This chapter provides an assessment of the significance of the positive and negative environmental impacts (direct and indirect) expected to be associated with the Buffelspoort Solar PV Energy Facility. Cumulative impacts are assessed in Chapter 8. This assessment has considered the construction of a Solar PV Energy Facility with a contracted capacity of up to 40 MWp. The Development Area considered for the proposed Project includes Portions 75 and 134 of the Farm Buffelspoort 343JQ and has a Development Area of approximately 77 ha. The grid connection infrastructure is located within an assessment corridor that varies in width from 200 m to 300m and is up to 2.5km in length and traverses Portions 75, 88, 89, 101, 119, 120, 121 and 122 of the Farm Buffelspoort 343JQ and Portions 101, 148, 236, 303, 374 and 376 of the Farm Kafferskraal 342JQ.

Infrastructure associated with the Solar PV Energy Facility will include:

- Solar PV arrays comprising PV panels and mounting structures.
- Inverters and transformers.
- Cabling between the arrays.
- Onsite facility substation.
- 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.
- Battery Energy Storage System (BESS)[16] – to be initiated at a later stage than the Solar PV Energy Facility.
- Temporary laydown area.
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.
- Fencing around the site, including an access gate.

The full extent of the Project Site (~ 223 ha) and Development Area (~77 ha) for the Solar PV Energy Facility, as well as the entire grid connection corridor was considered through the Scoping Phase of the EIA process by the independent specialists and the EAP. On-site sensitivities were identified through the review of existing information, desktop evaluations and detailed field surveys. The identification of the proposed Development Footprint for the Buffelspoort Solar PV Energy Facility within the Project Site[17] was undertaken by the Project Developer through consideration of the sensitive environmental features and areas, and application of a mitigation hierarchy which aimed at avoidance as the first level of mitigation. The proposed grid connection infrastructure will be positioned within the confines of the assessed grid connection corridor during the final design stage of the Project considering avoidance of sensitive environmental features and technical constraints. The specialist assessments undertaken as part of this EIA process have considered the Development Footprint and grid connection corridor (refer to **Figure 7.1**).

[16] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

[17] The Project Site is the aerial extent of the affected properties (~223ha) within which the Buffelspoort Solar PV Energy Facility is proposed.

The sections which follow provide a summary of the specialist input for each field of study in terms of the impacts which are expected to occur, the significance of the impacts, the opportunity for mitigation of the impacts to an acceptable level and the appropriate mitigation measures recommended for the reduction of the impact significance. Note that impacts associated with decommissioning are expected to be similar to those associated with construction activities however relevant legislation will be consulted before decommissioning takes place. Therefore, these impacts are not considered separately within this chapter. This section of the report must be read together with the detailed specialist studies contained in **Appendix D to J**.

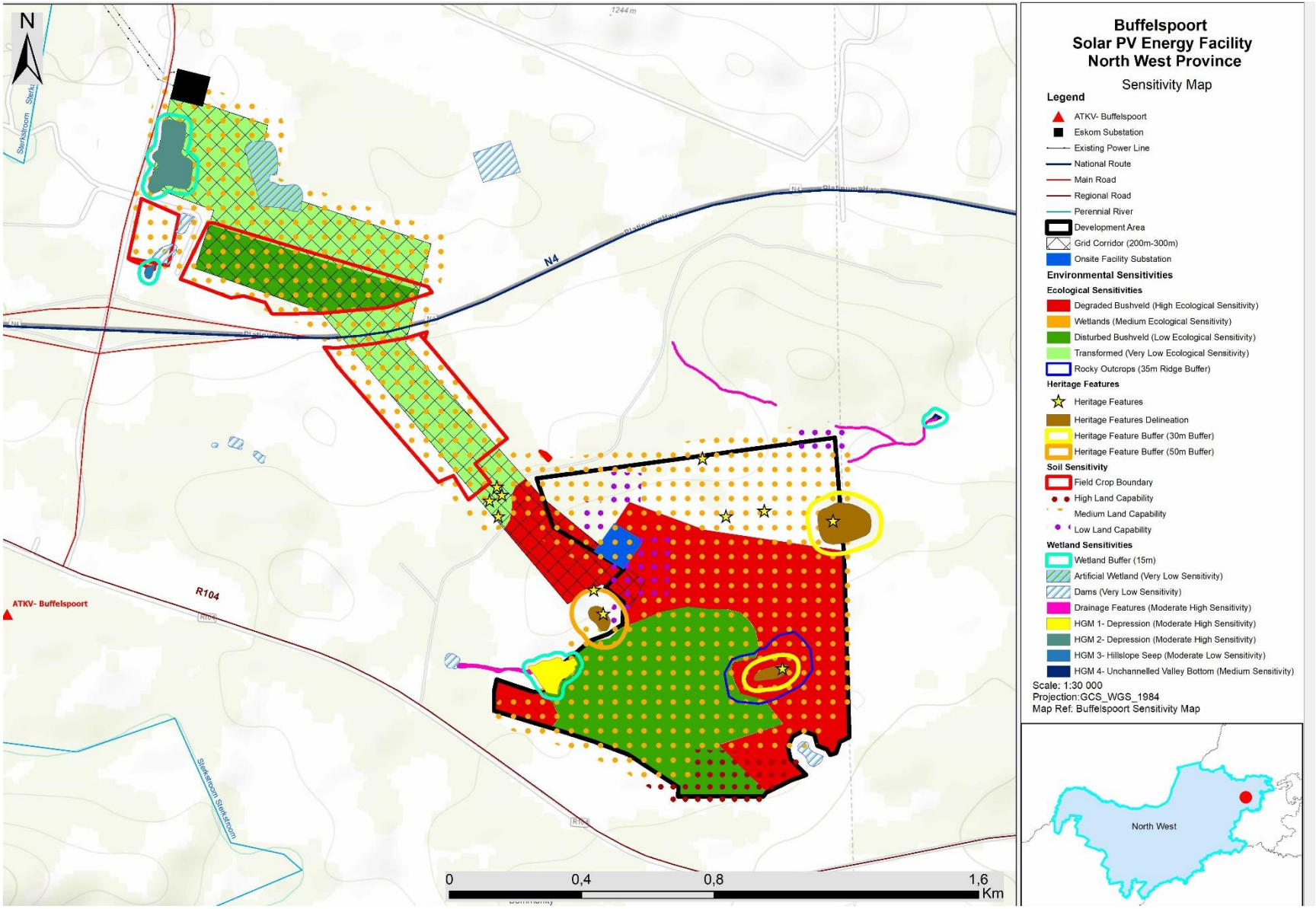


Figure 7.1: Proposed Buffelspoort Solar PV Energy Facility sensitivity Map

The development of the Project will comprise the following phases:

» Pre-Construction and Construction – will include; site preparation; establishment of access roads, construction camps, batching plant, laydown areas, and facility infrastructure; construction of foundations involving excavations and cement pouring; the transportation of components/construction equipment to the Project Site, manoeuvring and operating cranes for unloading and installation of equipment; laying cabling; and commissioning of new equipment and site rehabilitation. The construction phase for the Buffelspoort Solar PV Energy Facility is dependent on the number of PV modules to be erected but is estimated to be up to 12 months

» Operation – will include the operation of the Solar PV Energy Facility which will supply power to a private off-taker via a newly proposed 88kV single circuit overhead power line. The overhead power line will be approximately 2,5 km in length and will be routed across several privately-owned properties from the onsite Project substation to the point of interconnection, north of the N4 Bakwena National Highway. The operation phase of the Buffelspoort Solar PV Energy Facility is expected to be approximately – 15 years (with maintenance).

» Decommissioning – depending on the economic viability of the Solar PV Energy Facility and the need for electricity by the private off-taker, the length of the operational phase may be extended beyond the proposed 15-year period. At the end of the Project's life, decommissioning will include site preparation, disassembling of the components of the Solar PV Energy Facility, clearance of the relevant infrastructure at the site and rehabilitation.

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of the EIA Regulations, 2014 - Appendix 3: Scope of Assessment and Content of Environmental Impact Assessment Report.

Requirement	Relevant Section
3(1)(h)(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts (aa) can be reversed (bb) may cause irreplaceable loss of resources and (cc) can be avoided, managed or mitigated.	The impacts and risks identified to be associated with the construction and operation phases of the Project have been included in **Section 7.2.** Impact tables have been included for each field of study which considers the nature, significance, consequence, extent, duration and probability of the impacts, as well the reversibility of the impacts, the loss of resources and avoidance, management or mitigation, as expected at this stage in the S&EIA process.
3(1)(h)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	The positive and negative impacts associated with the Project have been included in **Section 7.2.**
3(1)(h)(viii) the possible mitigation measures that could be applied and level of residual risk	Possible mitigation (specifically relating to the avoidance of sensitive areas) has been included in **Section 7.2** where possible to provide such recommendations at this stage in the S&EIA process.

7.2 Potential Impact on Terrestrial Ecology

The development of the Project is likely to result in a variety of impacts associated largely with the disturbance, loss and transformation of intact vegetation and faunal habitat to hard infrastructure such as the Solar PV Energy Facility and service areas, roads, operations buildings etc. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix D**).

7.2.1 Results of the Terrestrial Ecology Impact Assessment

The Project Site is situated in the Savanna Biome. The savanna vegetation of South Africa represents the southern-most extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna Biome include a seasonal precipitation and a sub-tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006). Should be note that the Project Site's climatic conditions differ somewhat from the Savannah biome baseline: The study area is characterised by summer rainfall with a Mean Annual Precipitation (MAP) that ranges between 600 mm and 700 mm. The winter season is dry, and frost is fairly frequent.

The Savanna Biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over topped by a discontinuous, but distinct woody plant layer (Mucina & Rutherford, 2006). At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (*microphyllous*) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by *microphyllous* woody plants of the Mimosaceae family (Common genera include *Vachellia* and Albizia) and a generally dense herbaceous layer (Scholes & Walker, 1993).

Four (4) different terrestrial habitat types were delineated within the Development Footprint. All habitats within the assessment area of the proposed Project were allocated a sensitivity category. These are detailed in Table 7.1 and illustrated in Figure 7.1.

Table 7.1: Summary of habitat types delineated within the Development Area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Degraded Bushveld	Medium	High	Medium	Low	High
Wetlands	Medium	Medium	Medium	Low	Medium
Disturbed Bushveld	Medium	Low	Low	Medium	Low
Transformed	Very Low	Very Low	Very Low	Low	Very Low

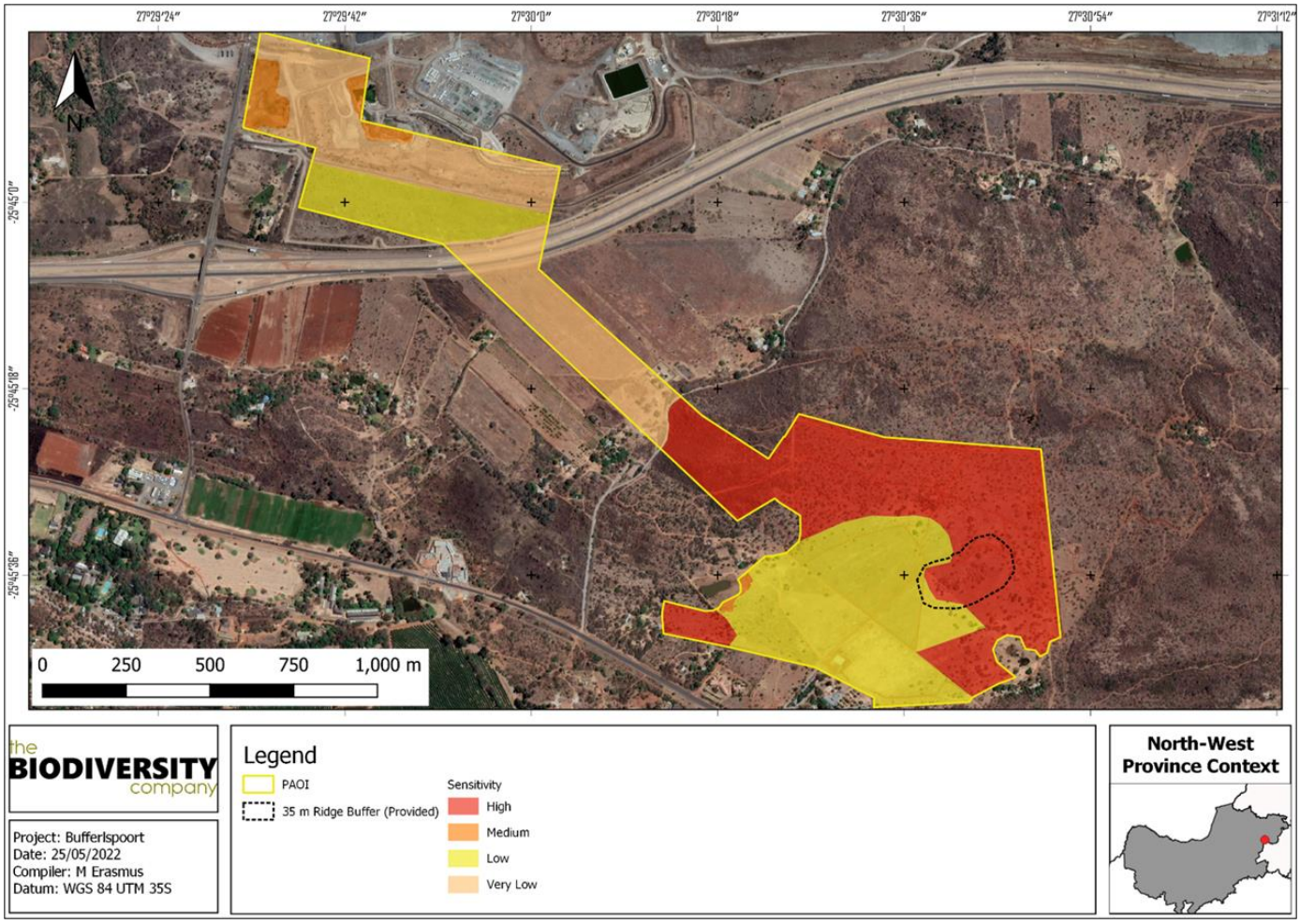


Figure 7.1: Sensitivity of the Development Footprint

7.2.2 Description of Terrestrial Ecology Impacts

Direct and indirect Impacts associated with the construction, operation and decommissioning phases of the proposed Project on ecology include the following:

Construction Phase:

- Destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community
- Introduction of alien species, especially plants;
- Destruction of protected plant species; and
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching).

Operation Phase:

The operational phase of the impact of daily activities is anticipated to further spread the IAP, as well as the deterioration of the habitats due to the increase of dust and edge effect impacts (changes in population or community structures that occur at the boundary of two or more habitats). Dust reduces the ability of plants to photosynthesize and thus leads to degradation/retrogression of the veld. Moving maintenance

vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but can also lead to direct mortalities due to collisions.

» Continued fragmentation and degradation of habitats and ecosystems;
» Spread of alien and/or invasive species;
» Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light and dust).

Decommissioning phase

This phase is when the scaling down of activities ahead of temporary or permanent closure is initiated. During this phase, the operational phase impacts will persist until of the activity ceases and the rehabilitation measures are implemented.

» Continued fragmentation and degradation of habitats and ecosystems; and
» Spread of alien and/or invasive species.

7.2.3 Table Impact tables summarising the significance of impacts on ecology during construction, operation (with and without mitigation)

Construction phase Impacts

Nature: Loss of vegetation within development footprint. Destruction, further loss and fragmentation of the habitats, ecosystems and vegetation community.		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Footprint & surrounding areas (2)
Duration	Permanent (5)	Long term (4)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	**High (68)**	**Medium (30)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, although this impact cannot be well mitigated as the loss of vegetation/habitat is unavoidable.	
Mitigation: » Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage. » Do not clear areas of indigenous vegetation outside of the direct Development Footprint. » Minimise vegetation clearing to the minimum required. » Consult a fire expert and compile and implement a fire management plan to minimise the risk of veld fires around the Project site. » Compile and implement a rehabilitation plan from the onset of the Project. » Rehabilitate areas as soon as they are no longer impacted by construction. » The rehabilitated areas must be revegetated with indigenous vegetation. » Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.		

- » Reduce the dust generated by operational vehicles and earth moving machinery, through wetting the soil surface (with "dirty water") and putting up signs to enforce speed limits to enforce reduced speeds.
- » No non-environmentally friendly suppressants may be used as this could result in pollution of water sources.
- » Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Surplus rehabilitation material can be applied to other others in need of stabilisation and vegetation cover.

Residual Impacts:
The loss of currently intact vegetation is an unavoidable consequence of the project and cannot be entirely mitigated.

***Nature*:** Introduction of alien species, especially plants.

Degradation and loss of surrounding natural vegetation

	Without mitigation	**With mitigation**
Extent	Regional (4)	Footprint & surrounding areas (2)
Duration	Long term (4)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (56)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- » Compile and implement an alien vegetation management plan from the onset of construction. The plan must identify areas for action (if any) and prescribe the necessary removal methods and frequencies to be applied. This plan must be also prescribing a monitoring plan and be updated as/when new data is collated;
- » Implementation of a waste management plan, this plan must also prescribe a monitoring plan and be updated as/when new data is collated. Waste management must be a priority and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site as required to prevent rodents and pests entering the site.
- » Refuse bins will be emptied and secured.
- » Temporary storage of domestic waste shall be in covered waste skips.
- » Maximum domestic waste storage period will be 7 days.
- » A pest control plan must be put in place and implemented; it is imperative that poisons not be used.

Residual Impacts:
Long-term broad scale IAP infestation if not mitigated.

***Nature*:** Destruction of protected plant species.

Construction activity will likely lead to direct loss of protected tree species

	Without mitigation	**With mitigation**
Extent	Footprint & surrounding areas (2)	Site Specific (1)
Duration	Permanent (5)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (52)**	**Low (10)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	Yes	No

Can impacts be mitigated?	Yes
***Mitigation*:** » Obtain relocation or destruction permits before any protected Trees are destroyed, if destruction cannot be avoided.	
***Residual Impacts*:** N/A	

***Nature*:** Displacement of faunal community due to habitat loss, direct mortalities and disturbance.

Construction activity will likely lead to direct mortality of fauna due to earthworks, vehicle collisions, accidental hazardous chemical spills and persecution. Disturbance due to dust and noise pollution and vibration may disrupt behaviour.

	Without mitigation	**With mitigation**
Extent	Regional (4)	Footprint & surrounding areas (2)
Duration	Moderate term (3)	Very short term (1)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (60)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, to some extent. Noise and disturbance cannot be well mitigated, impacts on fauna due to human presence, such as vehicle collisions, poaching, and persecution can be mitigated.	

***Mitigation*:**

» Demarcate work areas during the construction phase to avoid affecting areas that are not currently under construction. Use physical barriers e.g., safety tape, not painted lines, and use signage.
» Minimise vegetation clearing to the minimum required. Areas should be cleared and disturbed on a "needs" basis only, as opposed to clearing and disturbing a number of sites simultaneously.
» Provide All personnel and contractors to undergo Environmental Awareness Training to all personnel and contractors. A signed register of attendance must be kept for proof.
» The timing between clearing of an area and subsequent development must be minimized to avoid fauna from re-entering the site to be disturbed.
» Any holes/deep excavations must be done in a progressive manner on a needs basis only. In the event trenches/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and subsequently inspected prior to backfilling.
» Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.

Residual Impacts:
It is probable that some individuals of susceptible species will be lost to construction-related activities despite mitigation. However, this is not likely to impact the viability of the local population of any fauna species.

Operation Phase

***Nature*:** Continued fragmentation and degradation of habitats and ecosystems. Disturbance created during the construction phase will leave the project area vulnerable to erosion and IAP encroachment.		
	Without Mitigation	**With Mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Permanent (5)	Short term (2)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Improbable (2)
Significance	**High (64)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	
***Mitigation*:** » It should be made an offence for any staff to /take bring any plant species into/out of any portion of the Development Footprint. » No plant species whether indigenous or exotic should be brought into/taken from the Development Footprint, to prevent the spread of exotic or invasive species or the illegal collection of plants. » Implementation of an alien vegetation management plan.		
Residual *Impacts* There is still the potential some potential for erosion and IAP encroachment even with the implementation of control measures but would have a low impact.		

***Nature*:** Spread of alien and/or invasive species. Degradation and loss of surrounding natural vegetation		
	Without mitigation	**With mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (52)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
***Mitigation*:** » Implementation of an alien vegetation management plan. » Implementation of a waste management plan.		
Residual Impacts: Long term broad scale IAP infestation if not mitigated.		

Nature: Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration).

The operation and maintenance of the proposed development may lead to disturbance or persecution of fauna in the vicinity of the development.

	Without Mitigation	**With Mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Short term (2)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium**	**Low**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

***Mitigation*:**

» Outside lighting should be designed and limited to minimize impacts on fauna. Lighting fixtures should be fitted with baffles, hoods or louvres and directed downward. Outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible.
» Where feasible, motion detection lighting must be used to minimise the unnecessary illumination of areas.
» Minimise traffic and the use of vehicle lights of the road during the night.
» Noise must be kept to a minimum from dusk to dawn to minimize all possible disturbances to amphibian species and nocturnal mammals.

Residual Impacts

Disturbance from maintenance activities will occur albeit at a low and infrequent level.

Decommissioning Phase

Nature: Continued fragmentation and degradation of habitats and ecosystems.

Disturbance created during the construction phase will leave the Development Footprint vulnerable to erosion and IAP encroachment.

	Without Mitigation	**With Mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Permanent (5)	Short term (2)
Magnitude	High (8)	Low (4)
Probability	Highly probable (4)	Improbable (2)
Significance	**High (64)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	

***Mitigation*:**

» Limiting the closure and rehabilitation activities to the Development Footprint areas only. Avoid entry/access to previously undisturbed or already rehabilitated areas.
» Areas other than the Development Footprint areas and existing surface infrastructure areas, should be declared as 'no-go' areas to vehicles (only). All essential operational staff – machinery must be limited to Development Footprint (no need to go outside the authorised area).
» The rehabilitated areas must be revegetated with indigenous vegetation.

» Reduce the dust generated by operational vehicles and earth moving machinery, through wetting the soil surface (with "dirty water") and putting up signs to enforce speed limits to enforce reduced speeds. » Implementation of rehabilitation plan. » Implementation of an alien vegetation management plan.
Residual Impacts: There is still the potential some potential for erosion and IAP encroachment even with the implementation of control measures but would have a low impact.

Nature: Spread of alien and/or invasive species. Degradation and loss of surrounding natural vegetation.		
	Without mitigation	**With mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (52)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: » Ongoing implementation of an alien vegetation management plan. The updated plan must advise on the monitoring frequency post closure of the Project, and then advise on the 'completion' the plan as data is collated.		
Residual Impacts: » Long term broad scale IAP infestation if not mitigated.		

7.2.4 Overall Result

The present land use had a direct impact on both the fauna and the flora in the area, which is evident in the disturbed and transformed habitats. Historically, land clearing and the subsequent mismanagement has led to the deterioration of most of the area to a disturbed habitat that has not recovered since.

However, the degraded Bushveld habitat in the wider project area can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by development.

The degraded Bushveld habitat in the Study Area has a **High ecological theme sensitivity**.

The habitat sensitivity of the degraded Bushveld and wetland/water resources is regarded as high and medium respectively, due to the species recorded and the role of this intact unique habitat to biodiversity within a very fragmented local landscape, not to mention the sensitivity according to various ecological datasets.

The high sensitivity terrestrial areas still:
» Support nearby CBA/ESAs as per the conservation plan (NWBSP);
» Viable constituent of and EN ecosystem, NPAES, IBA and Biosphere Reserve; and

» Support various organisms and may play an important role in the ecosystem, if left to recover from the superficial impacts.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas provide a variety of ecological services considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is the most important aspect to consider for the proposed Project.

Development within the high sensitivity areas within the project area will lead the direct destruction and loss of functional habitats; and the faunal species that are expected to utilise this habitat. Thus, if these areas are not maintained in a natural or near natural state, destroyed or fragmented, then meeting targets for biodiversity features will not be achieved. The mitigation measures, management and associated monitoring regarding the expected impacts will be the most important factor of this Project.

The main expected impacts of the proposed Project will include:

» Habitat loss and fragmentation;
» Degradation of surrounding habitat;
» Disturbance and displacement caused during the construction and maintenance phases; and
» Direct mortality during the construction phase.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk. Considering that this area that has been identified as being of significance for biodiversity maintenance and ecological processes, development may proceed but with caution and only with the implementation of mitigation measures.

Considering the above-mentioned information, **no fatal flaws are evident for the proposed Project**. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

7.3 Impact on the Aquatic Ecology

The development of the Buffelspoort Solar PV Energy Facility is likely to result in a variety of impacts from an aquatic perspective. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E** for more details).

7.3.1 Results of the Aquatic Ecology Impact Assessment

During the site visit, four HGM units were identified within the 500 m regulated area (refer to Figure 7.2). The wetland areas were delineated in accordance with the DWAF (2005) guidelines. Two HGM units have been identified as depression wetlands, one has been identified as a hillslope seep wetland and one as a unchannelled valley bottom wetland. Along with the wetlands multiple drainage features as well as artificial wetlands and a few dams were also delineated. Although these systems do not classify as a natural wetland system it is important to note where they are and to preserve them.

The depression and hillslope seep wetlands scored a "Low" importance and sensitivity score due to the low protection level in the ecosystem as it is location in the agricultural fields meaning that the wetland will be stripped from all hydrophyte vegetation which limits its ability to contribute to biodiversity maintenance and

to provide habitat for species. The average ecosystem service score ranges between "Moderately Low" and "Moderately High".

A 15 m post mitigation buffer was assigned to the wetland systems.

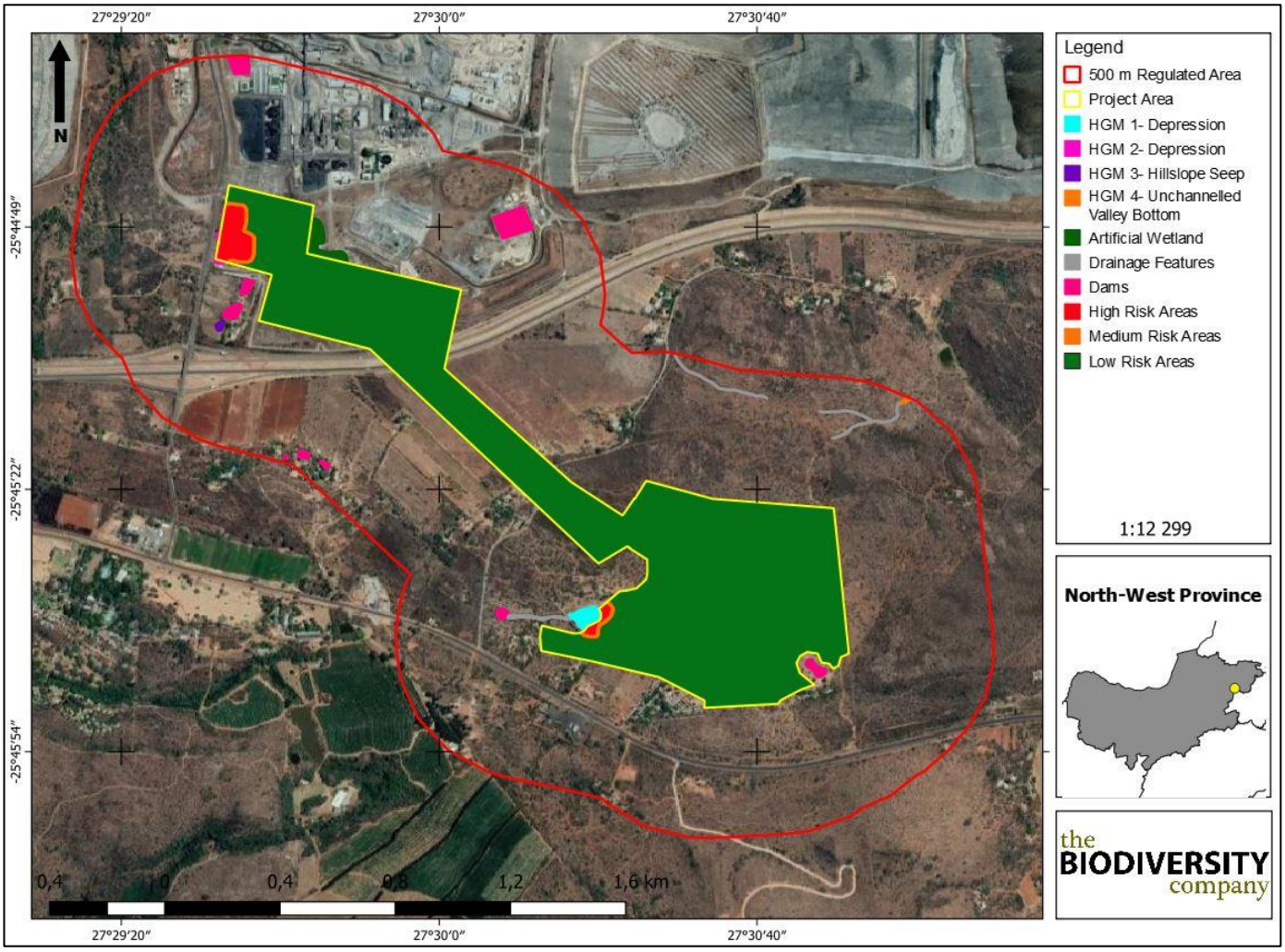


Figure 7.2: Identified risk areas

7.3.2 Description of Aquatic Ecology Impacts

The impact assessment considered both direct and indirect impacts, if any, to the wetland system. The mitigation hierarchy was considered for the proposed Project. In accordance with the mitigation hierarchy, the preferred mitigatory measure is to avoid impacts by considering options in project location, sitting, scale, layout, technology and phasing to avoid impacts. **Figure 7.2** indicates that avoidance will be possible.

A risk assessment was conducted to investigate the level of risk posed by the Project. Three (3) levels of risk have been identified and determined for the overall risk assessment, these include low, medium and high risk. High risks are not applicable based on the type of development, and the potentially limited directly impacted systems. Medium risk refers to wetland areas that are either on the periphery of the infrastructure and at an indirect risk. Low risks are wetland systems beyond the Project Site that would be avoided, or wetland areas that could be avoided if feasible. The medium risks were the priority for the risk assessment,

focussing on the expected potential for these indirect risks. **The significance of all post-mitigation risks was determined to be low.**

Construction, Operational and Decommissioning Phase

Nature includes the following impact

- Altered surface flow dynamics;
- Erosion;
- Alteration of sub-surface flow dynamics;
- Sedimentation of the water resource;
- Direct and indirect loss of wetland areas;
- Water quality impairment;
- Compaction;
- Decrease in vegetation;
- Change of drainage patterns;
- Altering hydromorphic properties; and
- Indirect loss of wetland areas..

	Without mitigation	**With mitigation**
Extent	Local Area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Low**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- The wetland and buffer areas must be avoided;
- A stormwater management plan must be compiled and implemented for the project, facilitating the diversion of clean water to the delineated resources;
- The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access;
- Laydown yards, camps and storage areas must be within project area;
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly;
- It is preferable that construction takes place during the dry season to reduce the erosion potential of the exposed surfaces;
- All chemicals and toxicants to be used for the construction must be stored within the drilling site and in a bunded area;
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping";
- Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);
- Have action plans on site, and training for contractors and employees in the event of spills, leaks and other impacts to the aquatic systems;

» Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; » No dumping of material on-site may take place; and » All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported.
Residual Impacts: » Low residual

7.3.3 Overall Results

Based on the results and conclusions presented in this section of the report, it is expected that the proposed activities will have low residual impacts on the wetlands and thus no fatal flaws were identified for the Project. A General Authorisation (GN 509 of 2016) is required for the water use authorisation.
The following Zones of Regulation (ZoR) are applicable to the drainage line identified within the assessment area:

» A 32 m Zone of Regulation in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) should be assigned to the drainage lines; and

A 100 m ZoR in accordance with the National Water Act, 1998 (Act No. 36 of 1998) should be assigned to the drainage lines.

7.4 Potential Impact on Avifauna

The development of the Buffelspoort Solar PV Energy Facility is likely to result in a variety of impacts from an avifaunal perspective. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix F** for more details).

7.4.1 Results of the Avifauna Impact Assessment

During the field assessment fifty-seven (57) bird species were recorded in the point counts of the survey, while thirty-six (36) species were recorded during incidental observations. **None of the species recorded were SCC**. The species recorded were generalist species, this is somewhat of a concern for an area that is a nature reserve. It is likely that the low number of species could be attributed to the season of the survey. The low number of water birds recorded is likely attributed to poor water quality in both the man-made dams on site and in the nearby Sterkstroom river. Only three (3) types of water birds were observed at three (3) dams and along two points of the Sterkstroom.

The different habitat types within the Development Footprint were delineated and identified based on observations during the field assessment as well as available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern and their ecosystem processes. The sensitivities were compiled for the avifauna study based on the one survey. All habitats within the Development Footprint were allocated a sensitivity category. These are detailed in **Table 7.2**. These sensitivity ratings differ to those presented for terrestrial ecology in Section 7.2 as this assessment considers the avifauna species recorded in the various habitats and their conservation statuses. The water resources in the area are of high ecological importance not only as a source of water but also because of the unique habitat they offer in the area surrounding them. The Degraded Bushveld had a unique assemblage of bird species due to the rocky outcrops found in this area, but as no species of conservation concern (SCC) were recorded the site

sensitivity was rated as **Medium**. The Disturbed Bushveld had a composition of bird species that are adapted to change and disturbance as such the site sensitivity was rated as **Low**.

Table 7.2: Site Sensitivity Summary of habitat types delineated within field assessment area of Development Area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Water Resources	Medium	High	Medium	Low	High
Degraded Bushveld	Medium	Medium	Medium	Low	Medium
Disturbed Bushveld	Medium	Low	Low	Medium	Low
Transformed	Very Low	Very Low	Very Low	Low	Very Low

7.4.2 Description of Avifaunal Impacts

The construction of the Solar PV Energy Facility, power line and associated infrastructure has been assessed collectively as their impacts overlap. The following potential impacts were considered:

» Destruction, fragmentation and degradation of habitats;
» Displacement of avifaunal community due to disturbance such as noise, light, dust, vibration;
» Collection of eggs and poaching;
» Roadkill

The operational phase of the impact of daily activities is anticipated to lead to collisions and electrocutions. Moving vehicles do not only cause sensory disturbances to avifauna, affecting their life cycles and movement, but can lead to direct mortalities due to collisions. The area inside the Project Site surrounding the direct Development Footprint will be maintained to prevent uncontrolled events such as fire, this practice will however result in the disturbance and displacement of breeding and non-breeding species.

The following potential impacts were considered:

» Collisions with PV panels, associated power lines and connection lines and fences;
» Electrocution with solar plant connections and overhead powerlines.
» Roadkill during maintenance procedures; and
» Habitat degradation and displacement of resident, visiting and breeding species.

7.4.3 Impact tables summarising the significance of impacts on avifauna during construction, operation and decommissioning (with and without mitigation)

Construction phase Impact

Nature: Destruction, fragmentation and degradation of habitats.		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Local area (3)
Duration	Short term (2)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Medium (56)**	**Medium (44)**

Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	To some extent, habitat will still be lost	
Mitigation: The loss of habitat in the Development Footprint cannot be negated but can be restricted to some extent by following the listed mitigations below. » The habitat outside the Development Footprint can be protected by implementing the following mitigations: » Construction activity to only be within the Development Footprint and the area is to be well demarcated. » The Development Footprint must be monitored quarterly for invasive plant encroachment and erosion and must be controlled. » All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the Development Footprint. » it is recommended that laydown areas within the Development Footprint is used, to avoid habitat loss and disturbance to adjoining areas. » Should any SCC not move out of the Development Footprint, or their nest be found in the Development Footprint a suitably qualified specialist must be consulted to advise on the correct actions to be taken.		
Residual Impacts*:* The loss of habitat is a residual impact that is unavoidable. The disturbance may also cause some erosion and invasive alien plant encroachment. Movement corridors will be disrupted in the Development Footprint.		

Nature*:* Displacement of avifaunal community (including several SCC) due to disturbance such as noise, light, dust, vibration.		
	Without mitigation	**With mitigation**
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Moderate term (3)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (36)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes, but only to a limited extent. The mitigation of noise pollution during construction is difficult to mitigate against	
Mitigation*:* » Minimize disturbance impact by abbreviating construction time, where possible. » Where possible try and schedule the construction activities to avoid breeding and movement time. » Ensure lights are kept to a minimum, lights must be red or green and not white to reduce confusion for nocturnal migrants. » Dust management need to be done in the areas where the vegetation will be removed, this includes wetting of the soil and/or chemical stabilisation.		
Residual Impacts*:* Displacement of endemic and SCC avifauna species.		

Nature: Collection of eggs and poaching		
	Without mitigation	**With mitigation**
Extent	Footprint & surrounding areas (2)	Footprint & surrounding areas (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Minor (2)

Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (40)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
» All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting or hunting terrestrial species (e.g. guineafowl and francolin), and owls, which are often persecuted out of superstition. » Signs must be put up stating that should any person be found poaching any species they will be fined.		
Residual Impacts: There is a possibility that the eggs to be poached could be that of an SCC with decreasing numbers		

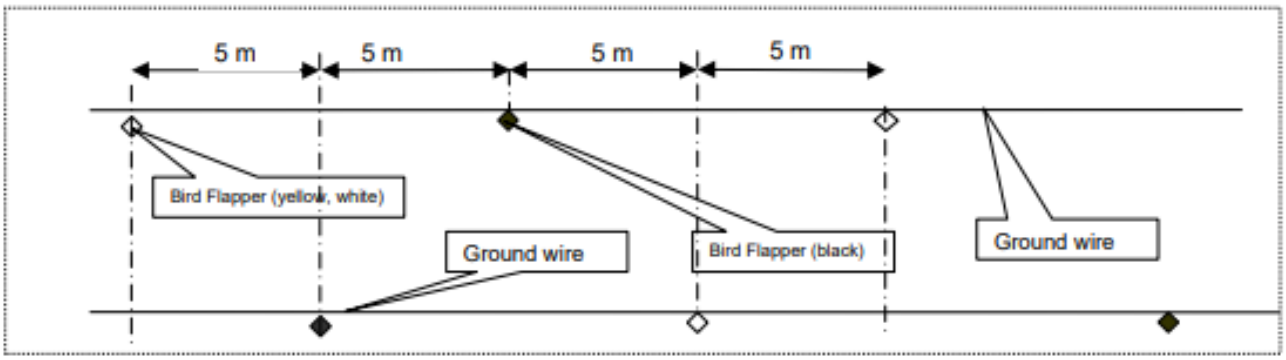
Nature: Roadkill		
	Without mitigation	**With mitigation**
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Improbable (2)
Significance	**Medium (44)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
» All construction vehicles should adhere to clearly defined and demarcated roads. Off-road driving should be prohibited outside of the Development Footprint area, unless necessitated. » All vehicles (construction or other) accessing the Project Site should adhere to a low-speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g. nightjars and owls) which sometimes forage or rest on roads, especially at night.		
Residual Impacts: Roadkills could still occur.		

Operation Phase Impact

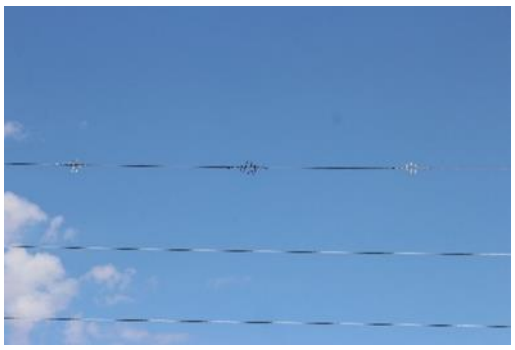
Nature: Collisions with PV panels, associated power lines and connection lines and fences		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High (64)**	**Medium (26)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation:		
» The design of the proposed Project must be of a type or similar structure as endorsed by the Eskom-Endangered		

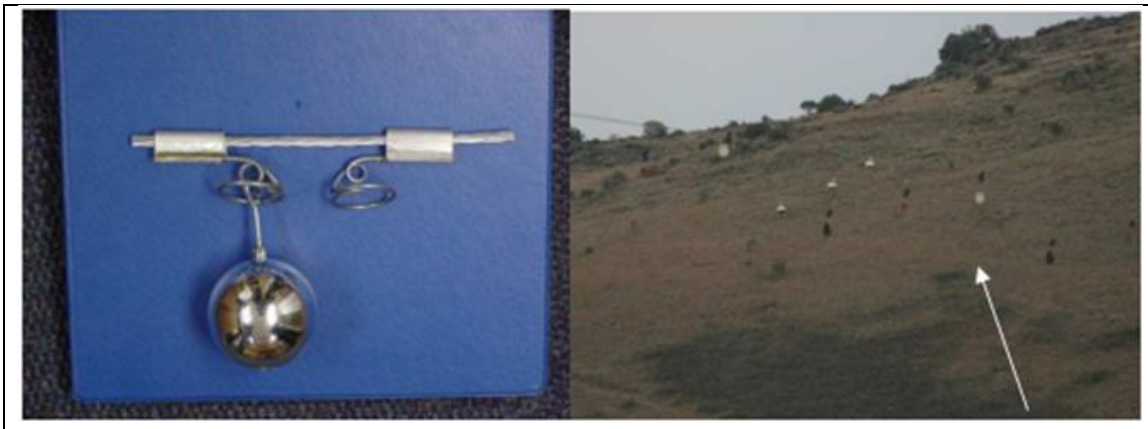
Wildlife Trust (EWT) Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.

» A streamer that bridges the earth plane.
  - Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.
  - Where the proposed overhead power lines crosses over the ridge bird diverters need to be placed on it. The bird diverters must be placed along the lines and not just near the poles as per the figure below of the other lines on the property. Diverters must be placed at 5 m intervals.



» Overhead cables/lines must be fitted with industry standard bird flight diverters along the ridge portions in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.





Inotec BFD800 (source: https://migratorysoaringbirds.birdlife.org/)

Residual Impacts:
Some collisions of SCCs and risk species might still occur regardless of mitigations

Nature: Electrocution by solar plant connections and power line.		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Regional (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Improbable (2)
Significance	**High (64)**	**Low (28)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

- The design of the proposed Project must be of a type or similar structure as endorsed by the Eskom-Endangered Wildlife Trust (EWT) Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa. Ecological design recommendations for this include:
  - The distance between the lines must be 1.8 m to decrease the risk of vulture electrocutions;
  - Insulation: covering energised parts and/or covering grounded parts with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered. The length of insulated chains should be higher than 0.70 m;
  - Install anti-perch devices.
- Infrastructure should be consolidated where possible/practical in order to minimise the amount of ground and air space used.
- Ensure that visual monitoring is sufficiently frequent to detect electrocutions reliably and that any areas where electrocutions occurred are repaired as soon as possible.
- During the first year of operation quarterly reports, summarizing interim findings should be complied and submitted to BirdLife South Africa. If the findings indicate that electrocutions have not occurred or are minimal with no red-listed species, an annual report may not be submitted. This can be completed by technicians but should include photographic evidence of the affected species to allow for identification.

Residual Impacts:
Electrocutions might still occur regardless of mitigations

Nature: Roadkill during maintenance procedures

	Without mitigation	**With mitigation**
Extent	Local area (3)	Local area (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (39)**	**Low (22)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

» All personnel should undergo environmental induction with regards to avifauna and their behaviour on roads.
» All vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed, unless necessary and approved.
» All vehicles accessing the Project Site should adhere to a low speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g. nightjars and owls) which sometimes forage or rest on roads, especially at night.

Residual Impacts:
Road collisions can still occur regardless of mitigations

Nature:
Habitat degradation and displacement of resident, visiting and breeding species (as well as SCCs).

	Without mitigation	**With mitigation**
Extent	Regional (4)	Local area (3)
Duration	Long term (4)	Short term (2)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High (64)**	**Medium (33)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	No, the footprint has already been disturbed. The area surrounding the development can be mitigated to some extent.	

Mitigation:

» Minimising habitat destruction caused by the maintenance by demarcating the Development Footprint.
» All areas where maintenance (for example grass cutting) must be walked through prior to any activity to ensure no nests or SCC avifauna species are found in the area. Should any Species of Conservation Concern not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.

Residual Impacts:
Migratory routes of avifauna species could change, and the species composition could also change regardless of mitigations

Decommissioning Phase Impact

Nature: Continued fragmentation and degradation of habitats.

	Without mitigation	**With mitigation**
Extent	Local area (3)	Footprint & surrounding areas (2)
Duration	Long term (4)	Very short term (1)

Magnitude	High (8)	Minor (2)
Probability	Highly probable (4)	Very improbable (1)
Significance	**Medium (60)**	**Low (5)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

» Implementation of a rehabilitation plan.
» Implementation of an alien invasive management plan and monitoring on an annual basis for 3 years post construction.
» There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous flora.

Residual Impacts:

No significant residual risks are expected, although IAP encroachment and erosion might still occur but would have a negligible impact if effectively managed.

Nature: Displacement of faunal community (including SCC) due disturbance (road collisions, noise, dust, vibration).

	Without mitigation	**With mitigation**
Extent	Regional (4)	Local area (3)
Duration	Long term (4)	Moderate term (3)
Magnitude	High (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**High (64)**	**Medium (36)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	

Mitigation:

» Minimize disturbance impact by abbreviating decommissioning time, if possible.
» Dust management need to be done in the areas where the vegetation will be removed, this includes wetting of the soil. This area must be rehabilitated as soon as possible.
» All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the decommissioning area.
» All vehicles (construction or other) accessing the site should adhere to a low speed limit on site (40 km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g. nightjars and owls) which sometimes forage or rest on roads, especially at night.

Residual Impacts:

If this is mitigated and monitored correctly no residual impacts should be present

Nature: Collisions with the power lines if not removed during decommissioning.

	Without mitigation	**With mitigation**
Extent	Regional (4)	Site specific (1)
Duration	Long term (4)	Very short term (1)
Magnitude	High (8)	None (0)
Probability	Highly probable (4)	Very improbable (1)
Significance	**High (64)**	**Low (2)**
Status (positive or negative)	Negative	Negative
Reversibility	Moderate	High

Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: If the line is removed after/if the plant is decommissioned, the risk of collisions will be absent.		
Residual Impacts: No residual impact will remain if the line is removed as part of the decommissioning.		

7.4.4 Overall

The proposed Project will have a high or medium impact on the avifauna which, in most instances, could be reduced to a lower impact through appropriate mitigation. **Based on the current types of bird species recorded in the Development Footprint the proposed Project will not have a high residual impact should all the mitigations and recommendations be implemented.**

No fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

7.5 Assessment of Impacts on Land Use, Soil and Agricultural Potential

The development of the Buffelspoort Solar PV Energy Facility is likely to result in a variety of impacts from a soils and agricultural potential perspective. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix G** for more details).

7.5.1 Results of the Land Use, Soil, and Agricultural Potential Assessment

The most sensitive soil forms identified within the Project Site is the Hutton and Tukulu soil forms, with other associated soils also occurring. The Hutton soil form consists of an orthic topsoil horizon on top of a thick red apedal subsurface diagnostic horizon below. The Tukulu soil form consists of an orthic topsoil on top of a thick neocutanic horizon underlain with gleyic horizon.

The land capability of the above-mentioned soils has been determined to have land capability classes of "II" and "III" with a climate capability level 8 given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capabilities and climate capabilities results in land potentials "L5" and "L6". The "L5" land potential level is characterised by a restricted potential. Regular and/or moderate to severe limitations occur due to soil, slope, temperatures or rainfall. The "L6" land potential level is characterised by a very restricted potential. Regular and/or severe limitations occur due to soil, slope, temperatures or rainfall. These areas are non-arable. The "L5" and "L6" land potential are characterized with a "Low Sensitivity".

The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the Project Site, which predominantly covers "Moderately Low" to "Moderate" sensitivities. Smaller patches are characterised by sensitivities up to "Moderately High" (**Figure 7.4**). Furthermore, various crop field boundaries were identified by means of the DEA Screening Tool (2022), which indicated that the grid connection corridor is predominantly characterised by "High" sensitivity crop fields (see **Figure 7.5**). It is mainly recommended that high sensitivity crop field be avoided. However, in the event that relocating of the

Project Site is not feasible, stakeholders should undertake an evaluation of possible agreement with the landowners prior to any development in those areas.

The overhead power line is proposed to have transect some high sensitivity crop fields with mitigation the proposed Buffelspport will have a low impact on the land potential resources.

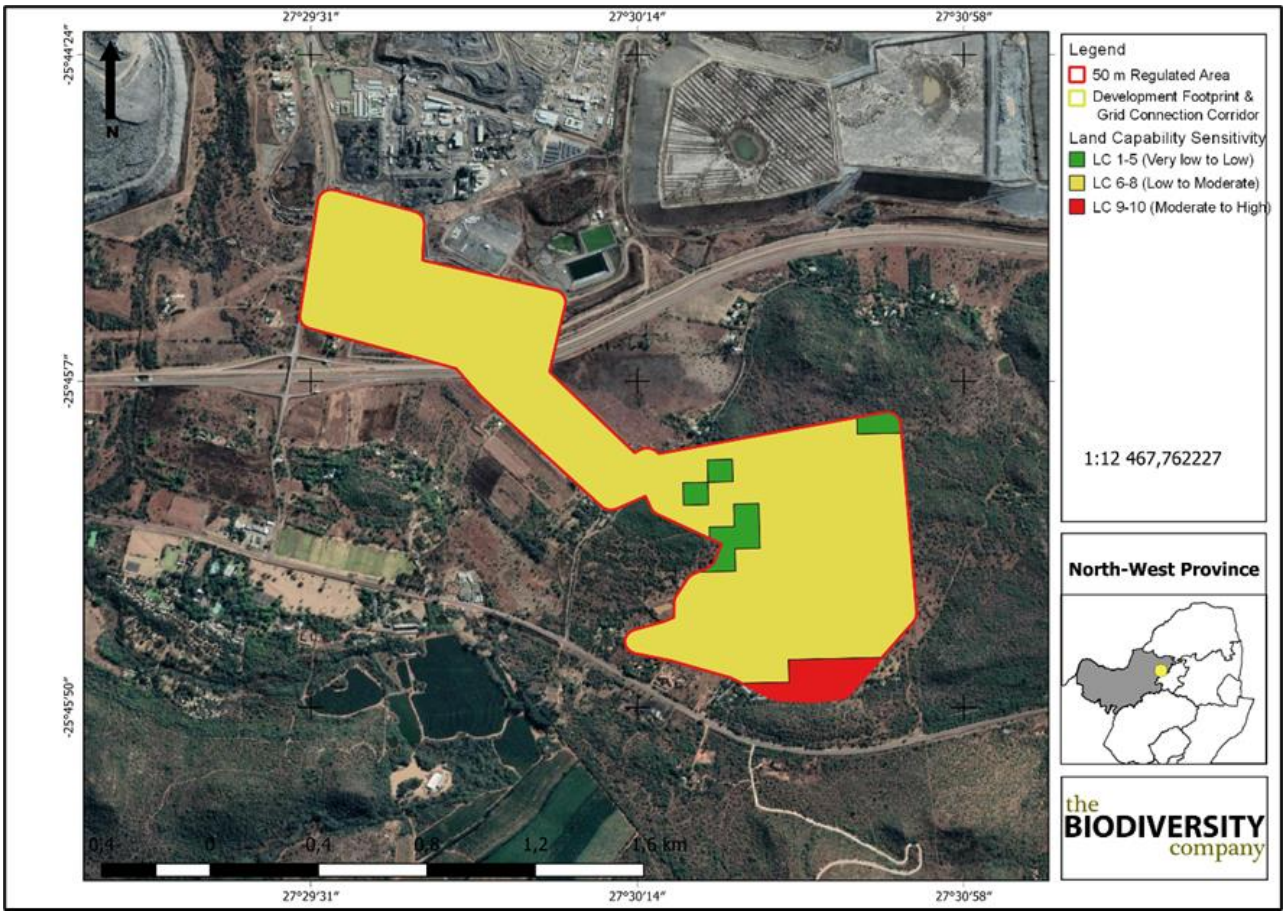


Figure 7.4: Land capability sensitivity (DAFF, 2017)

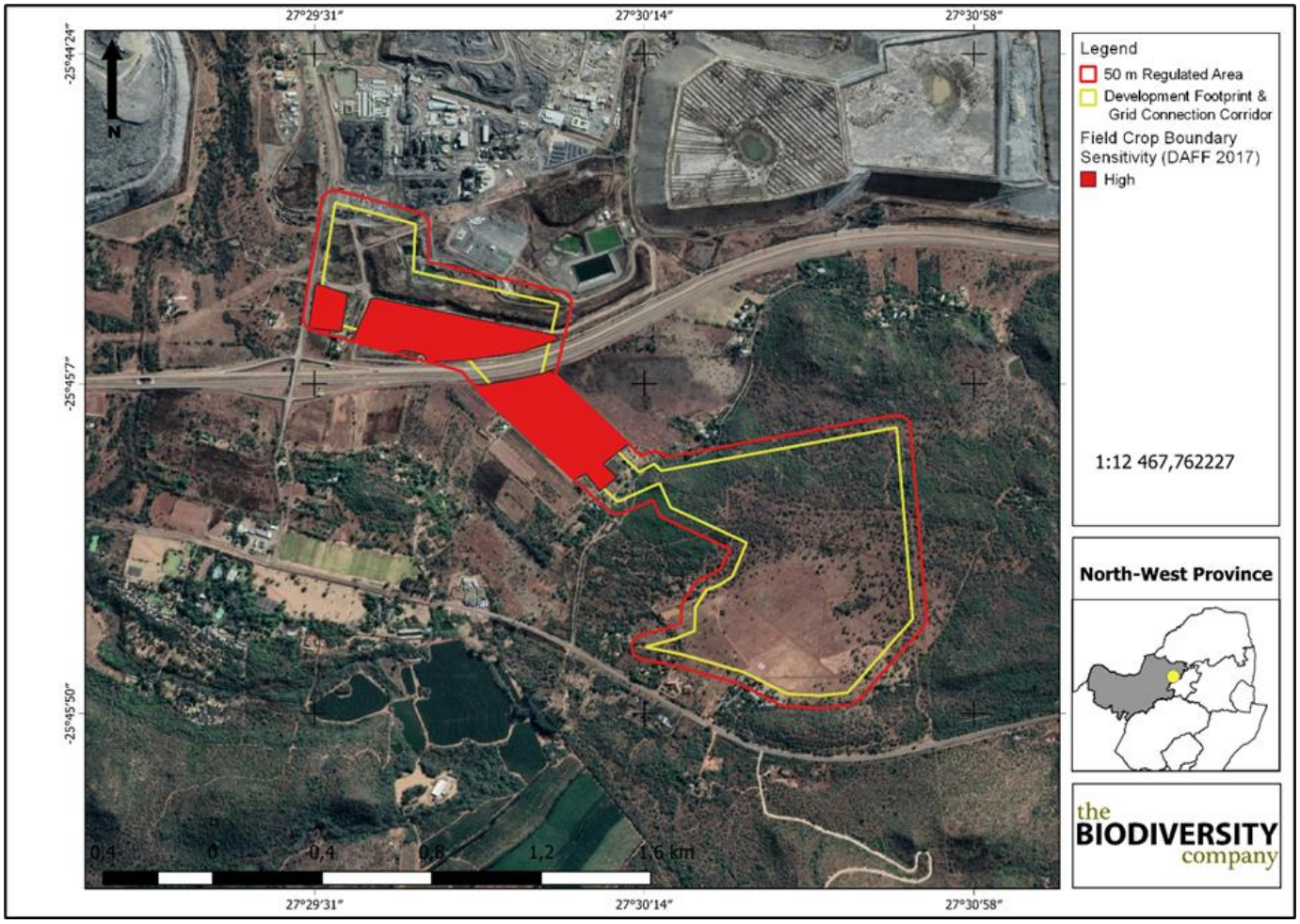


Figure 7.5: Crop boundary sensitivity (DEA Screening Tool, 2022)

7.5.2 Description of Impacts on Land Use Soil, and Agricultural Potential Assessment

Construction Phase

The proposed Project will result in the stripping of topsoil and alterations to the existing land uses. The changes in the land use will be from agricultural to renewable development (or transformed). The proposed activities will impact on areas expected to be of high agricultural production (in some areas), with some aspects affecting covers "Moderately Low" to "Moderate" sensitivity areas. It is possible that suitable agricultural land could become fragmented, resulting in these smaller portions no longer being deemed feasible to farm.

During the construction phase, foundations will be cleared with topsoil often being stripped and stockpiled. Access roads will be created with trenches being dug for the installation of relevant cables/pipelines. Construction of substation sites will take place together with the erection of transmission lines where relevant. Contractor and laydown yards will also be cleared with construction material being transported to laydown yards. Potential erosion is expected during the construction phase due to some erodable soils within the Development Footprint, such as the Vaalboos and Tukulu soil forms. The removal vegetation and changes to the local topography could result in an alteration to surface run-off dynamics. Erosion of the area could result in further loss of topsoil, and soil forms suitable for agriculture.

Operational Phase

During the operational phase, limited impacts are foreseen. Concrete areas will be equipped with drains to reduce soil erosion on exposed areas. Only the Development Footprint area will be disturbed to minimise soil and vegetation disturbance of the surrounding area. Revegetation will be carried out on exposed surrounding areas to avoid surface erosion. Maintenance of vegetation and solar PV infrastructure will have to be carried out throughout the life of the Project. It is expected that these maintenance practices can be undertaken by means of manual labour.

The operational phase of the renewable project (Constructed Infrastructure) includes anthropogenic movement and activities. The relevant infrastructure will be occupied by professionals throughout the lifetime of the operation. Besides compaction and erosion caused by increased traffic and surface water run-off for the area, few aspects are expected to be associated with this phase. The spread of alien invasive species will be a risk, predominantly adjacent to developed areas (edge effect).

7.5.3 Impact tables summarising the significance of impacts on land use, soil and agricultural potential during the construction, operation, and decommissioning phases (with and without mitigation)

Construction Phase Impact

Nature: Loss of land capability		
	Without mitigation	***With mitigation***
Extent	***Local area (3)***	***Footprint & surrounding areas (2)***
Duration	***Moderate Term (3)***	***Moderate Term (3)***
Magnitude	***Low (4)***	***Low (4)***
Probability	***Probable (3)***	***Low (2)***
Significance	***Medium (30)***	***Low (18)***
Status (positive or negative)	***Negative***	***Negative***
Reversibility	***High***	***High***

Irreplaceable loss of resources?	***No***	***No***
Can impacts be mitigated?	***Yes***	

Mitigated:

Limited mitigation is required given the fact that the pre- mitigation significance rating has been scored as "Medium – Negative" and the post- mitigation significance rating being scored as "Low – Negative". The following specific measures are intended to secure a low residual risk:

- ***Avoidance of all high agricultural production land and other actively cultivated areas, where avoidance is not feasible stakeholder engagement should occur to negotiate an agreement with the affected landowners.***
- ***Make use of existing roads or upgrades tracks before new roads are constructed. The number and width of internal access routes must be kept to a minimum.***
- ***A stormwater management plan must be implemented for the Project. The plan must provide input into the road network and management measures.***
- ***PV mounting foundations and associated infrastructure must be (preferably) located in already disturbed areas that are not actively cultivated.***
- ***Rehabilitation of the Development Footprint must be initiated from the onset of the Project. Soil stripped from infrastructure placement can be used for rehabilitation efforts.***
- ***An alien invasive plant species and control programme must be implemented from the onset of the Project.***

Residual Impacts:

Limited residual impacts will be associated with these activities, assuming that all prescribed mitigation measures be strictly adhered to.

Operational Phase

Nature: Loss of land capability		
	Without mitigation	***With mitigation***
Extent	***Footprint & surrounding areas (2)***	***Footprint & surrounding areas (2)***

Duration	***Long Term (4)***	***Long Term (4)***
Magnitude	***Moderate (6)***	***Minor (1)***
Probability	***Probable (3)***	***Low (2)***
Significance	***Medium (36)***	***Low (14)***
Status (positive or negative)	***Negative***	***Negative***
Reversibility	***High***	***High***
Irreplaceable loss of resources?	***No***	***No***
Can impacts be mitigated?	***Yes***	

Mitigation:

Limited mitigation is required given the fact that the pre- mitigation significance rating has been scored as "Medium – Negative" and the post- mitigation significance rating being scored as "Low – Negative". The following specific measures are intended to secure a low residual risk:

- ***Avoidance of all high agricultural production land and other actively cultivated areas, where avoidance is not feasible stakeholder engagement should occur to negotiate an agreement with the affected landowners;***
- ***Make use of existing roads or upgrades tracks before new roads are constructed. The number and width of internal access routes must be kept to a minimum;***
- ***A stormwater management plan must be implemented for the development. The plan must provide input into the road network and management measures;***
- ***PV mounting foundations and associated infrastructure must be (preferably) located in already disturbed areas that are not actively cultivated; and***
- ***Rehabilitation of the area must be initiated from the onset of the project. Soil stripped from infrastructure placement can be used for rehabilitation efforts; and***
- ***An alien invasive plant species and control programme must be implemented from the onset of the project.***

Residual Impacts:

Limited residual impacts will be associated with these activities, assuming that all prescribed mitigation measures be strictly adhered to.

Overall result

The Project Site is associated with both arable and non-arable soils. However, the available climatic conditions of low annual rainfall and high evapotranspiration potential severely limits crop production significantly resulting in land capabilities with "Low" and "Moderate high" sensitivities. The land capabilities associated with the Project Site are suitable for cropping and grazing, which corresponds with the current land use.

The overhead power line is proposed to transect some of the high sensitivity crop fields identified. These crop fields were identified as high sensitivity by the DFFE screening tool (2022). In this case, moving the power line to avoid high sensitivity crop fields is not feasible. Therefore, an agreement with the landowners should be reached prior to the development of the power line component of the Project within these areas.

The final results indicate ""Low" post-mitigation significance score ratings for the proposed components. It is therefore clear that the proposed activities are expected to have a low impact on land potential resources. It is the specialist's opinion that the proposed Project will have no impacts on the agricultural production ability of the land. **Therefore, the proposed Buffelspoort Solar PV Energy Facility may be favourably considered.**

7.6 Impacts on Heritage (Archaeology and Palaeontology)

Potential impacts on heritage resources and the relative significance of the impacts associated with the development of the Buffelspoort Solar PV Energy Facility is summarised below (refer to **Appendix H**).

7.6.1 Results of the Heritage Impact Assessment

During the fieldwork, a total of seven (7) heritage features and resources where identified. These consist of one (1) burial ground with approximately 100 graves, three (3) localities with recent historic structures and one (1) kraal, as well as two (2) low to moderate significance archaeological sites (refer to **Figure 7.6**).

Archaeological Resources

The two archaeological sites identified, are characterised by large areas of stonewalling (BFP-01 and BFP-03). Site BFP-01 consists of a long continuous stone wall running along a raised outcrop, although no other cultural material was identified within the proposed Development Footprint. The Project Developer has excluded this site employing buffers put in place for the layout of the Solar PV Energy facility. Site BFP-03 is a large stone wall site with numerous stone-walled enclosures. It appears the area was already disturbed as it now functions as a feeding ground for the game in the area. There is evidence of some of the stonewalling being destroyed whereas others still appear to be in their original state, no other cultural material was identified in the area. It is located just outside (at the north-eastern corner) of the proposed Development Footprint.

The sites BFP01 and BFP03 have a low and moderate heritage significance respectively and a heritage rating of IIIC and IIIB.

Burial Grounds and Graves

A single burial ground consisting of approximately 100 graves was identified at site BFP-02. The site was indicated to the fieldwork team by the owner of the property. The informal graveyard lies just outside (west) the proposed Development Footprint. Although the area is overgrown by vegetation, some of the graves are still identifiable and consist mainly of stone-packed or stone-lined grave dressings, except for a few concrete or marble grave dressing features. Due to the cultural and religious significance of burial grounds, the site is graded as Grade IIIA. The Development footprint is outside the burial grounds and areas graded as Grade IIIA.

The site BFP-02 has a high heritage significance and heritage rating of IIIA. This site has high heritage sensitivity.

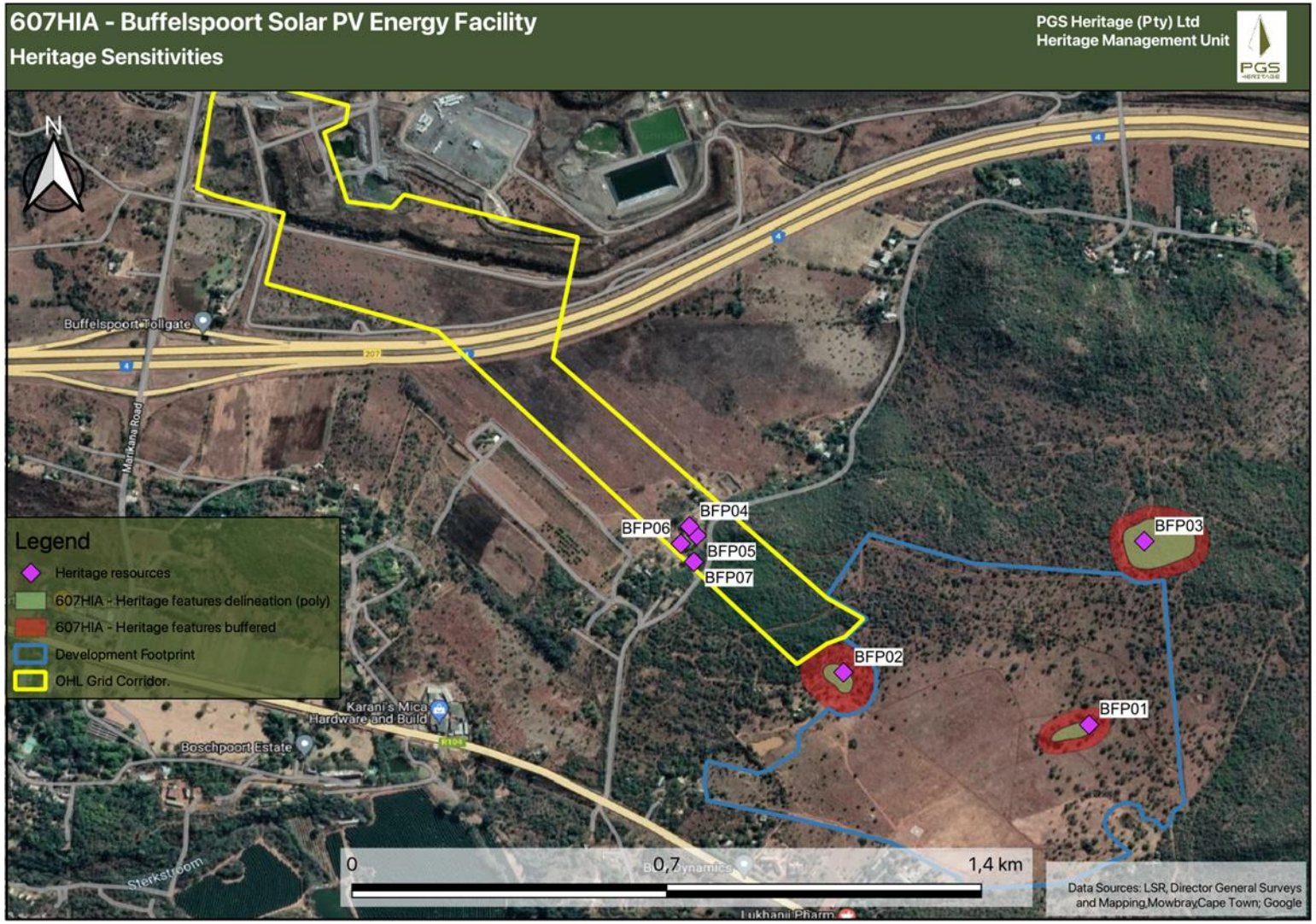


Figure 7.6: Identified heritage resources (marked in purple) within the proposed Development Footprint (marked in blue) and the OHL Grid Corridor (marked in yellow)

Historical Structures

The recent historic structures (BFP-04, BFP-06 and BFP-07) and the kraal (BFP-05) are all younger than 60 years and vary in preservation. They are all currently abandoned. The structures and remains of structures are not conservation worthy and contain no cultural or scientific value and are consequently graded as not conservation worthy (NCW).

BFP-04, BFP-05, BFP-06 and BFP-07 were rated as not conservation worthy and of no heritage significance.

Palaeontology

According to the PalaeoMap of SAHRIS, the Palaeontological Sensitivity of the proposed Development Footprint is zero or insignificant

7.6.2 Description of the Heritage Impacts

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development. The main impacts expected to occur on the archaeological and palaeontological heritage associated with the development of the Project will be during the construction phase. No major impacts are expected during the operation or decommissioning phase.

7.6.3 Impact tables summarising the significance of impacts on heritage during construction, operation and decommissioning (with and without mitigation)

Construction

Nature: Archaeological resources have been identified during the survey. These sites are of moderate significance and rated as IIIB.		
	Without mitigation	**With mitigation**
Extent	Moderate/High (4)	Low (1)
Duration	Permanent (5)	Long-term (4)
Magnitude	High (8)	Low (2)
Probability	Highly Probable (4)	Unlikely (2)
Significance	**High (68)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: » A 30-meter buffer should be implemented firm the outer edge of the archaeological site. » If the preservation of the site is not possible mitigation before destruction will be required. o Phase 2 archaeological mitigation process must be implemented. This will include, surface collections, test excavations and analysis of recovered material. o A permit issued under Section 35 of the NHRA will be required to conduct such work. o On completion of the mitigation work the Project Developer can apply for a destruction permit with the backing of the mitigation report. o This work will need to be done as part of the (Environmental Management Programme) EMPr implementation prior to construction.		
Residual Impacts: Considering the nature of the sites identified in the present study, the residual risk will be moderate.		

Nature: Graves and Burial Grounds have been identified during the survey. The site is of high significance and rated as IIIA.		
	Without mitigation	**With mitigation**
Extent	Moderate/High (4)	Low (1)
Duration	Permanent (5)	Long-term (4)
Magnitude	High (8)	Low (2)
Probability	Highly Probable (4)	Unlikely (2)
Significance	**High (68)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: » The sites should be demarcated, and a 50-meter no-go-buffer zone must be enforced. The graves should be avoided and left in situ. » A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (**which needs approval by SAHRA BGG**). » If the site is going to be impacted directly and the graves need to be removed, a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA BGG under the NHRA and National Health Act regulations.		
Residual Impacts: Considering the nature of the sites identified in the present study, the residual risk will be moderate.		

Nature: Historical Structures have been identified during the survey. These sites were rated as not conservation worthy and of no heritage significance.		
	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Unlikely (2)
Significance	**Low (21)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: » No mitigation is required.		
Residual Impacts: Considering the nature of the sites identified in the present study, the residual risk will be moderate.		

7.6.4 Overall Results

Heritage resources are outside the Development Footprint of the Buffelspoort Solar PV Energy Facility. The initial projected impact is rated as LOW to HIGH on these heritage resources before mitigation measures. Through the combination of the various environmental, cultural, and socio-economic sensitivities, the client can develop a layout option that will reduce the impact on the heritage resources. **The proposed layout reduces the impact on the heritage resource identified to LOW.**

7.7 Assessment of Visual Impacts

Negative impacts on visual receptors will occur during the undertaking of construction activities and the operation of the Buffelspoort Solar PV Energy Facility. Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix I)**.

7.7.1 Results of the Visual Impact Assessment

The viewshed analysis for the Project presented in Figure 7.7 and 7.8 was undertaken from a representative number of vantage points within the Development Footprint at an offset of 5m above ground level for the PV panels and 15 m above ground level for the overhead power line. This was done in order to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels, inverters, BESS, power line, etc.) associated with the facility.

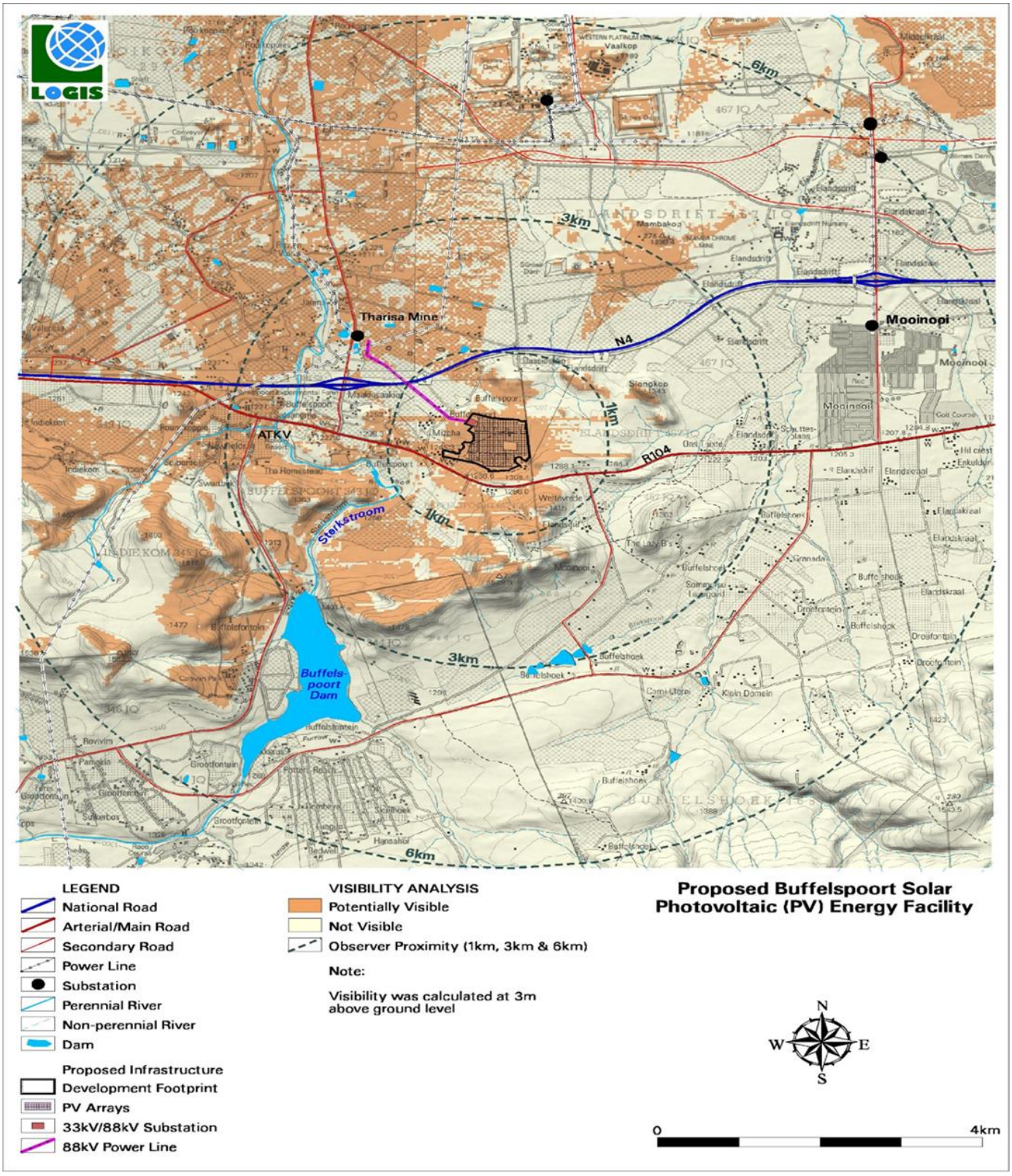


Figure 7.7: Viewshed analysis of the proposed Buffelspoort Solar PV Energy Facility

Figures 7.7 and 7.8 also indicates proximity radii from the Development Footprint in order to show the viewing distance (scale of observation) of the facility in relation to its surrounds. The viewshed analysis includes the effect of vegetation cover and existing structures on the exposure of the proposed infrastructure.

The combined results of the visual exposure, viewer incidence/perception and visual distance of the proposed Solar PV Energy Facility are displayed on **Figure 7.9**. Here the weighted impact and the likely areas of impact have been indicated as a visual impact index. Values have been assigned for each potential visual impact per data category and merged to calculate the visual impact index.

The criteria (discussed in detail within the VIA report contained in Appendix I) which inform the visual impact index are:

» Visibility or visual exposure of the structures
» Observer proximity or visual distance from the structures
» The presence of sensitive visual receptors
» The perceived negative perception or objections to the structures (if applicable)
» The visual absorption capacity of the vegetation cover or built structures (if applicable)

An area with short distance visual exposure to the proposed infrastructure, a high viewer incidence and a potentially negative perception (i.e. a sensitive visual receptor) would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact and determining the potential magnitude of the visual impact.

The index indicates that potentially sensitive visual receptors within a 1km radius of the Solar PV Energy Facility may experience a very high visual impact. The magnitude of visual impact on sensitive visual receptors subsequently subsides with distance to; high within a 1–3 km radius (where/if sensitive receptors are present) and moderate within a 3–6 km radius (where/if sensitive receptors are present). Receptors beyond 6 km are expected to have a low potential visual impact.

» 0 – 1 km
The majority of the exposed areas in this zone fall within vacant open space but does contain farm residences (especially to the west and north) and sections of the N4 Bakwena National Highway and R104 Old Rustenburg arterial road.

The following sensitive visual receptors may experience visual impacts of very high magnitude:
- Observers travelling/residing along the R104 Old Rustenburg arterial road (site 1)
- Observers travelling along a short section of the N4 Bakwena National Highway (site 3)
- Residents at the Buffelspoort homestead (site 2)

» 1 – 3 km
Visual exposure within this zone includes farm residences and sections of the N4 Bakwena National Highway and R104 Old Rustenburg arterial road to the west. Visual exposure to the north falls within mining land with existing visual clutter and disturbances.

The following sensitive visual receptors may experience visual impacts of high magnitude:
- Observers travelling/residing along the R104 Old Rustenburg arterial road (site 4)
- Residents at homesteads on small holdings north of the N4 Bakwena National Highway (site 5)

- Residents at homesteads on small holdings south of the N4 Bakwena National Highway including some hillside chalets at the AKTV resort (site 6)

» 3 – 6 km

Most of the visual exposure falls within mining or vacant agricultural land to the north and west. The following sensitive visual receptors may experience visual impacts of moderate magnitude:

- Residents at homesteads on small holdings north of the N4 Bakwena National Highway (site 7)
- Buffelsfontein homestead (site 8)
- Indiekom homestead (site 9)

» >6 km

At distances exceeding 6 km, the intensity of visual exposure is expected to be low and highly unlikely due to the distance between the object (Solar PV Energy Facility) and the observer, and the developed nature of the Study Area.

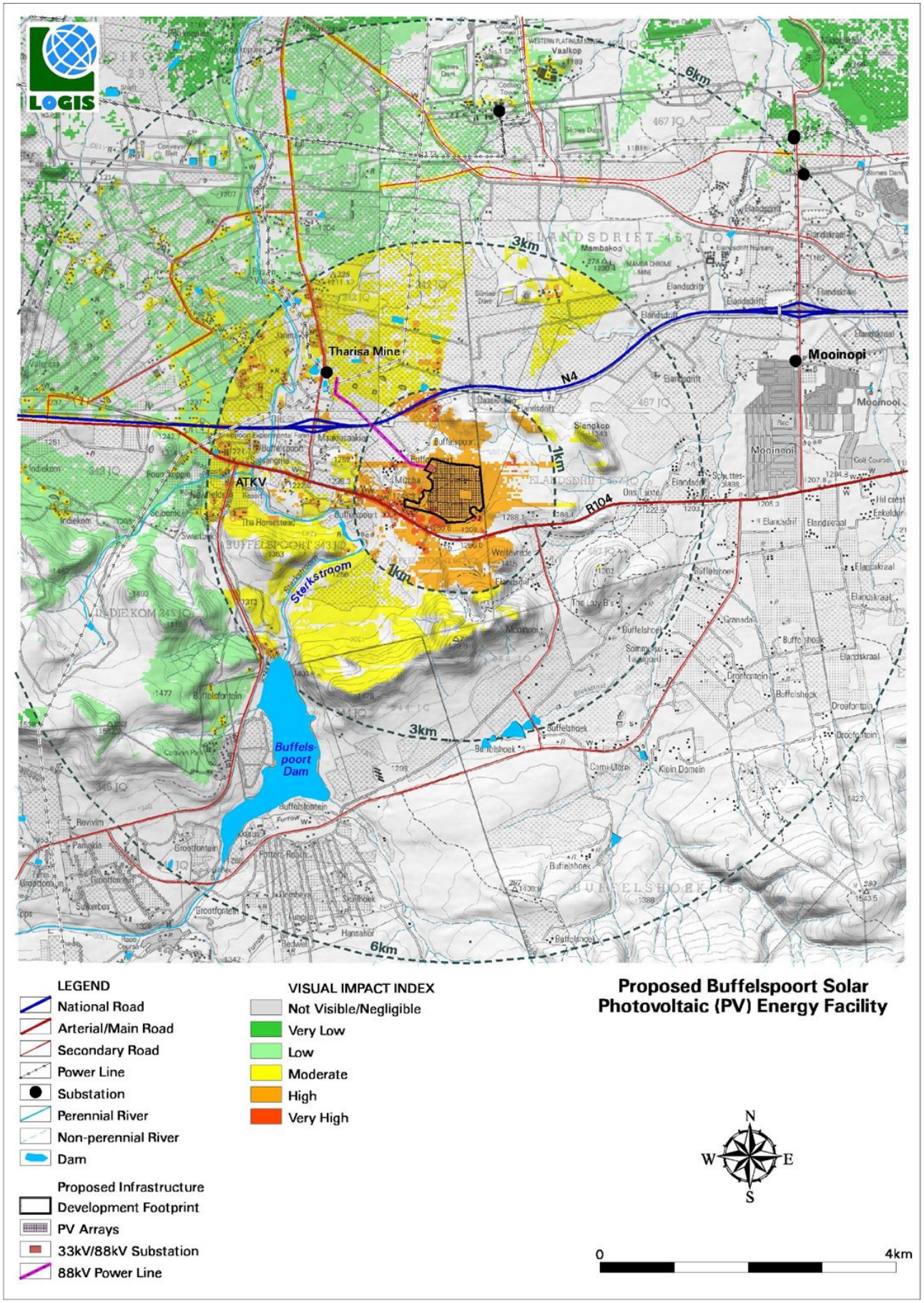


Figure 7.8: Visual impact index and potentially affected sensitive visual receptors

7.7.2 Description of Visual Impact

Anticipated issues related to the potential visual impact of the proposed Solar PV Energy Facility were identified during the Scoping Phase and included the following:

- The visibility of the Solar PV Energy Facility to, and potential visual impact on, observers travelling along the N4 Bakwena National Highway and R104 Old Rustenburg arterial road in closer proximity to the proposed infrastructure.
- The visibility of the Solar PV Energy Facility to, and potential visual impact on residents of dwellings within the study area, with specific reference to the farm residences (to the west and north) in closer proximity to the proposed development.
- The potential visual impact of the Solar PV Energy Facility on the visual character or sense of place of the region.
- The potential visual impact of the Solar PV Energy Facility on tourist routes or tourist destinations/facilities (e.g. the ATKV holiday resort and the Bosveld Paradys Bed and Breakfast).
- The potential visual impact of the construction of ancillary infrastructure (i.e. internal access roads, buildings, power line, etc.) on observers in close proximity to the facility.
- The visual absorption capacity of the natural vegetation or built structures/mining infrastructure (if applicable).
- Potential cumulative visual impacts (or consolidation of visual impacts), with specific reference to the placement of the Solar PV Energy Facility within a predominantly mining area.
- The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in close proximity of the Solar PV Energy Facility.
- Potential visual impact of solar glint and glare as a visual distraction and possible air/road travel hazard (if required).
- Potential visual impact of solar glint and glare on static ground-based receptors (residents of homesteads) in close proximity to the Solar PV Energy Facility (if required).
- Potential visual impacts associated with the construction phase.
- The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may potentially constitute a visual impact at a local and/or regional scale.

7.7.3 Impact table summarising the significance of visual impacts during Planning, construction and operation (with and without mitigation)

Planning Phase

Nature: Visual impact on residents of homesteads and observers travelling along the R104 Old Rustenburg arterial Road and N4 Bakwena National Highway within a 1 km radius of the Solar PV Energy facility structures.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Very high (10)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	**High (72)**	**Moderate (42)**

Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation / Management: » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the Development Footprint, where possible. » Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. » Investigate the potential to screen affected receptor sites (if applicable and located within 1 km of the facility) with planted vegetation cover.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy facility infrastructure is removed. Failing this, the visual impact will remain.		

Nature of Impact: Visual impact on observers travelling along the R104 Old Rustenburg arterial road and residents of homesteads within a 1 – 3km radius of the Solar PV Energy Facility structures		
	Without mitigation	***With mitigation***
Extent	Short distance (3)	Short distance (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Moderate **(45)**	Low **(26)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, however best practice measures are recommended.	
Mitigation / Management: » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.		

Nature of Impact: Visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed Solar PV Energy facility.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Very High (10)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Moderate **(54)**	Low **(28)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:		

» Shield the sources of light by physical barriers (walls, vegetation, or the structure itself). » Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights, where practical and it will not impact security integrity for the Project Site. » Make use of minimum lumen or wattage in fixtures. » Make use of down-lighters, or shielded fixtures. » Make use of Low Pressure Sodium lighting or other types of low impact lighting. » Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Nature of Impact: The visual impact of solar glint and glare as a visual distraction and possible road travel hazard		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Moderate **(36)**	Low **(24)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	N.A.
Can impacts be mitigated?	Yes	
Mitigation: » Use anti-reflective panels and dull polishing on structures, where possible and industry standard. » Adjust tilt angles of the panels if glint and glare issues become evident, where possible. » If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible. » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint.		
Residual impacts: N.A.		

Nature of Impact: The visual impact of solar glint and glare on residents of homesteads in closer proximity to the Solar PV Energy Facility.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low **(24)**	Low **(24)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: » Use anti-reflective panels and dull polishing on structures, where possible and industry standard. » Adjust tilt angles of the panels if glint and glare issues become evident, where possible.		

» If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site, where possible.
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.

Nature: Visual impact of the ancillary infrastructure during the operation phase on observers in close proximity to the structures.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Moderate (42)	Moderate (42)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the Development Footprint/power line servitude where possible.		
Residual impacts: The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: The potential impact on the sense of place of the region.		
	Without mitigation	***With mitigation***
Extent	Medium to longer distance (2)	Medium to longer distance (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (20)**	**Low (20)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: Planning: » Retain/re-establish and maintain natural vegetation (if present) immediately adjacent to the development footprint/servitude, where possible.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.		

Construction Phase Impacts

Nature of Impact: Visual impact of construction activities on users of the secondary road in close proximity to the proposed Solar PV Energy facility.

	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Short term (2)	Short term (2)
Magnitude	Very High (10)	Moderate (6)
Probability	Definite (5)	Highly Probable (4)
Significance	High **(80)**	Moderate **(48)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Planning:

» Retain and maintain natural vegetation (if present) immediately adjacent to the Development Footprint.

Construction:

» Ensure that vegetation cover adjacent to the Development Footprint (if present) is not unnecessarily removed during the construction phase, where possible.
» Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.
» Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
» Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
» Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).
» Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts.
» Rehabilitate all disturbed areas (if present/if required) immediately after the completion of construction works.

Residual impacts:

None, provided rehabilitation works are carried out as specified.

Operation Phase Impacts

Nature: Visual impact on residents of homesteads and observers travelling along the R104 Old Rustenburg arterial Road and N4 Bakwena National Highway within a 1 km radius of the Solar PV Energy facility structures.

	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Very high (10)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	**High (72)**	**Moderate (42)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation / Management:

» Maintain the general appearance of the facility as a whole.

Residual impacts:

The visual impact will be removed after decommissioning, provided the Solar PV Energy facility infrastructure is removed. Failing this, the visual impact will remain.

Nature of Impact: Visual impact on observers travelling along the R104 Old Rustenburg arterial road and residents of homesteads within a 1 – 3km radius of the Solar PV Energy Facility structures		
	Without mitigation	***With mitigation***
Extent	Short distance (3)	Short distance (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Moderate **(45)**	Low **(26)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, however best practice measures are recommended.	
Mitigation / Management: » Maintain the general appearance of the facility as a whole.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Visual impact of the ancillary infrastructure during the operation phase on observers in close proximity to the structures.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Moderate (42)	Moderate (42)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: » Maintain the general appearance of the infrastructure.		
Residual impacts: The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: The potential impact on the sense of place of the region.		
	Without mitigation	***With mitigation***
Extent	Medium to longer distance (2)	Medium to longer distance (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (20)**	**Low (20)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures:		

» Maintain the general appearance of the facility as a whole.
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.

Decommissioning Phase

Nature: Visual impact on residents of homesteads and observers travelling along the R104 Old Rustenburg arterial Road and N4 Bakwena National Highway within a 1 km radius of the Solar PV Energy facility structures.		
	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Very high (10)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	**High (72)**	**Moderate (42)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation / Management: » Remove infrastructure not required for the post-decommissioning use. » Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy facility infrastructure is removed. Failing this, the visual impact will remain.		

Nature of Impact: Visual impact on observers travelling along the R104 Old Rustenburg arterial road and residents of homesteads within a 1 – 3km radius of the Solar PV Energy Facility structures		
	Without mitigation	***With mitigation***
Extent	Short distance (3)	Short distance (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	Moderate **(45)**	Low **(26)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, however best practice measures are recommended.	
Mitigation / Management: » Remove infrastructure not required for the post-decommissioning use. » Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.		

Nature: Visual impact of the ancillary infrastructure during the operation phase on observers in close proximity to the structures.

	Without mitigation	***With mitigation***
Extent	Very short distance (4)	Very short distance (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Moderate (42)	Moderate (42)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: » Remove infrastructure not required for the post-decommissioning use. » Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts: The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Nature: The potential impact on the sense of place of the region.		
	Without mitigation	***With mitigation***
Extent	Medium to longer distance (2)	Medium to longer distance (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (20)**	**Low (20)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures: » Remove infrastructure not required for the post-decommissioning use. » Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts: The visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed. Failing this, the visual impact will remain.		

7.7.4 Overall Results

The findings of the Visual Impact Assessment undertaken for the proposed Buffelspoort PV Solar facility and its associated infrastructure is that the visual environment surrounding the site, especially within a 1 km radius (and potentially up to a radius of 3 km) of the proposed facility, may be visually impacted during the anticipated operational lifespan of the facility (i.e. a minimum of 15 years).

The following is a summary of impacts remaining, assuming mitigation as recommended, is exercised:

» During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the Project Site that may cause, at the very least, a visual nuisance to other road users and residents in the

area. Construction activities may potentially result in a high, temporary visual impact, that may be mitigated to moderate.

- The Solar PV Energy facility is expected to have a high visual impact pre-mitigation and a moderate visual impact post mitigation on residents of homesteads and observers travelling along the R104 Old Rustenburg arterial road and N4 Bakwena National Highway within a 1 km radius.
- The operational Solar PV Energy Facility could have a moderate visual impact on observers travelling along the R104 Old Rustenburg arterial road and residents at homesteads north south of the N4 Bakwena National Highway including visitors to the AKTV resort within a 1 – 3 km radius of the Solar PV Energy Facility structures. This impact may be mitigated to low.
- The anticipated impact of lighting at the Solar PV Energy Facility is likely to be of moderate significance, and may be mitigated to low.
- The potential visual impact related to solar glint and glare as a road travel hazard is expected to be of moderate significance mitigated to low significance.
- There are a fair number of residences located within a 1km radius of the proposed Solar PV Energy Facility. The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is therefore expected to be of low significance, both before and after mitigation.
- The anticipated visual impact resulting from the construction of on-site ancillary infrastructure is likely to be of moderate significance both before and after mitigation.
- The anticipated visual impact of the proposed Solar PV Energy Facility on the regional visual quality (i.e. beyond 6km of the proposed infrastructure), and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of low significance.

The anticipated visual impacts listed above (i.e. post mitigation impacts) range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed facility are not considered to be fatal flaws for the proposed Solar PV Energy Facility. **Considering all factors, it is recommended that the development of the facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management programme.**

7.8 Assessment of Social Impacts

Potential social impacts and the relative significance of the impacts associated with the development of the Buffelspoort Solar PV Energy Facility are summarised below (refer to **Appendix xx**).

7.8.1 Results of the Social Impact Assessment

The proposed Project Site is located in between the N4 Bakwena National Highway and R104 Old Rustenburg arterial road. The N4 Bakwena National Highway very much divides the Study Area (geographical area of approximately 154 km²) into two (2) distinct land use categories, with the area north of this road predominantly given to large scale mining, and the southern section with a more agricultural and natural character. The topography of the region is similarly divided into two (2) distinct classes, where the northern parts are described as plains and undulating plains, and the southern parts consist of mountains and tall hills.

These mountains are the northern foothills of the Magaliesberg Mountains, located further south of the Study Area. The Sterkstroom River traverses the Study Area from the south (from the Buffelspoort Dam) to the north towards the Beestekraal Dam, located north of the Study Area. Other than this river there are a number of non-perennial streams and farm or mining dams within the study area.

The most prominent (and visible) land use within the region is the mining activities, mining infrastructure, tailings dams and waste rock dumps. Interspersed with these mining activities are agricultural land uses, ranging from irrigated agriculture, dryland agriculture and citrus farming (orchards) predominantly to the south. Agricultural activities include the production of maize, wheat and sunflower crops, as well as cattle farming. The farmers working these fields predominantly reside at homesteads or farm residences scattered throughout the study area. Homesteads located in closer proximity to the proposed Buffelspoort Solar PV Energy Facility site include Buffelspoort, Mizpah, Maakiesaakie, Dassieklip and Elandsdrift.

From a review of planning policies and plans it was concluded that the development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The BPDM Spatial Development Framework (SDF) and Integrated Development Plan (IDP)and RLM IDP also supports the development of renewable energy. The development of the proposed Buffelspoort Solar PV Energy Facility is therefore supported by key policy and planning documents.

7.8.2 Description of Social Impacts

The majority of social impacts associated with the Project are anticipated to occur during the construction phase of the development and are typical of the type of social impacts generally associated with construction activities. These impacts will be temporary and short-term (~12 months) but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent social impacts associated with the ill-placement of project components or associated infrastructure or result in the mismanagement of the construction phase activities.

Potential Social Impacts during the Construction Phase

The positive and negative social impacts identified and assessed for the construction phase includes:

- Creation of direct, indirect and induced employment opportunities
- Economic multiplier effects
- Industry stimulation
- Influx of jobseekers and change in population structure
- Safety and security impacts
- Impacts on daily living and movement patterns
- Nuisance impacts, including noise and dust

Potential Social Impacts during the Operation Phase

It is anticipated that the Project will operate for approximately 15 years, or as long as required by the private off-taker.

The potential positive and negative social impacts that could arise because of the operation of the proposed Project include the following:

» Direct and indirect employment opportunities
» Development of renewable energy infrastructure
» Visual impact and sense of place impacts

7.8.3 Impact tables summarising the significance of socio-economic impact during construction, operation and decommissioning (with and without mitigation measures)

Construction Phase Impacts

Nature: Employment opportunities and skills development. The creation of employment opportunities and skills development opportunities during the construction phase for the country and local economy		
	Prior to Enhancement	***Post Enhancement***
Duration	Short-term (2)	Short-term (2)
Extent	Local – Regional (3)	Local-Regional (3)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	**Low Positive (24)**	**Medium (48)**
Enhancement measures: To enhance the local employment, skills development and business opportunities associated with the construction phase, it is recommended that the following measures be considered for implementation: » Adoption of a local employment policy to maximise the opportunities made available to the local labour force. The Buffelspoort Solar Project (Pty) Ltd should make it a requirement for contractors to implement a 'locals first' policy, especially for semi and low skilled job categories. » Enhance employment opportunities for the immediate local area, i.e., RLM. If this is not possible, then the broader focus areas should be considered for sourcing workers. » Consideration must be given to women during the recruitment process. » It is recommended that realistic local recruitment targets be set for the construction phase.		
Residual Risks: Improved pool of skills and experience in the Study Area.		

Nature: Multiplier effects on the local economy. Significance of the impact from the economic multiplier effects from the use of local goods and services.		
	Prior to Enhancement	**Post Enhancement**
Duration	Short term (2)	Short term (2)
Extent	Local, Regional and National (4)	Local (2)
Magnitude	Low (4)	Low (4)
Probability	Medium Probable (3)	Highly Probable (4)
Significance	**Low Positive (24)**	**High (36)**

Enhancement measures:

- Investigate the possibility of procurement of construction materials, goods and products from the local suppliers where available or feasible, in order to source as much goods and services as possible to maximise the benefit of the local economy.
- Buffelspoort Solar Project (Pty) Ltd should develop a database of local companies, specifically Historically Disadvantaged (HD) companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work where applicable.
- It is a requirement to source as much services as possible from the local suppliers, where feasible.
- Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible.

Residual Risks:
Growth and enhanced services in local, regional and National sectors.

Nature: Migration from jobseekers and population changes.

Added pressure on economic and social infrastructure during construction as a result of in-migration of people to the region

	Prior to Mitigation	**Post Mitigation**
Duration	Short-term (2)	Short-term (2)
Extent	Local (2)	Local (2)
Magnitude	Low (4)	Minor (2))
Probability	Medium Probability (3)	Improbable (1)
Significance	**Low Negative (24)**	**Low Negative (12)**

Mitigation:
No mitigation measures are proposed due to the neutral status of the impact.

Residual Risks:
Possibility of outside workers remaining in the neighbourhood after construction is completed and subsequent pressures on local infrastructure.

Nature: Disruption of daily living and movement patterns.

Temporary increase in traffic disruptions and movement patterns during the construction phase.

	Prior to Mitigation	**Post Mitigation**
Duration	Short-term (2)	Short-term (2)
Extent	Local – National (3)	Local (2)
Magnitude	Moderate (6)	Low (4)
Probability	Medium Probability (3)	Medium Probability (3)
Significance	**Medium Negative (30)**	**Low Negative (16)**

Mitigation:

- All vehicles used during the construction phase by contractors must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.
- Heavy vehicles used during the construction phase by contractors should be inspected regularly to ensure their road safety worthiness.
- Where possible to try and avoid heavy vehicle activity during 'peak' traffic hours (when people are driving to and from work).
- Damage / wear and tear caused by construction related traffic to the roads must be repaired.

» A comprehensive employee induction programme must be prepared to cover site access protocols, fire management and road safety. The Buffelspoort Solar Project Pty Ltd needs to allow for the role of Community Liaison. A grievance mechanism should be implemented that documents how the local community can express any complaints or grievances during the construction process.
Residual Risks: None anticipated.

Nature: **Safety and security**		
Impact description: Temporary increase in safety and security impacts associated with influx of job seekers during the construction phase		
	Prior to Mitigation	**Post Mitigation**
Duration	Short-term (2)	Short-term (2)
Extent	Local (2)	Local (2)
Magnitude	Low (4)	Low (4)
Probability	Medium Probability (3)	Medium probability (3)
Significance	**Low Negative (27)**	**Low Negative (16)**
Mitigation: » Access in and out of the Development Footprint should be strictly controlled by the Buffelspoort Solar Project Pty Ltd. » Appropriate security procedures need to be designed and implemented at the Project Site to limit access to the Development Footprint. » No open fires on the site for heating, smoking or cooking will be allowed except in designated areas. » Adequate firefighting equipment needs to be available on site and selected construction staff needs to be provided with firefighting training. » A comprehensive employee induction programme must be prepared to cover site access protocols, fire management and road safety. » The Buffelspoort Solar Project Pty Ltd needs to allow for the role of Community Liaison. A grievance mechanism should be implemented that documents how the local community can express any complaints or grievances during the construction process.		
Residual Risks: None anticipated.		

Nature : Nuisance impacts (noise& dust) Nuisance impacts in terms of a temporary increase in noise and dust.		
	Prior to Mitigation	**Post Mitigation**
Duration	Short-term (2)	Short-term (2)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Highly Probable (1)
Significance	**Medium Negative (36)**	**Low Negative (18)**
Mitigation: » Dust suppression measures should be implemented, such as mechanical wetting or chemical stabilisation on a regular basis to avoid generating excessive dust on site. » Vehicles carrying emitting loads such as soil, sand etc. needs to be fitted with tarpaulins or covers to avoid the generation of nuisance dust.		

» The Buffelspoort Solar Project Pty Ltd needs to allow for the role of Community Liaison. A grievance mechanism should be implemented that documents how the local community can express any complaints or grievances during the construction process.
Residual Risks: None anticipated

Operation Phase Impacts

Nature: Job creation during operation. The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy		
	Prior to Enhancement	***Post Enhancement***
Duration	Long term (4)	Long-term (4)
Extent	Local -Regional (3)	Local - Regional (3)
Magnitude	Low (4)	Low (4)
Probability	Medium Probable (3)	High Probable (4)
Significance	**Medium Positive (33)**	**Medium Positive (44)**
Enhancement measures: » It is recommended that a local employment policy is adopted by the Project Developer to maximise the project opportunities made available to the local community. Enhancement of employment opportunities for the immediate local area, RLM, if this is not possible, then the broader focus areas should be considered for sourcing employees. » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible		
Residual Risks: Improved pool of skills and experience in the local area		

Nature: Development of clean, renewable energy infrastructure. Development of clean, renewable energy infrastructure.		
	Prior to Enhancement	***Post Enhancement***
Duration	Long term (4)	Long term (4)
Extent	Local – Regional -National (4)	Local – Regional -National (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	**Medium Positive (46)**	**Medium Positive (46)**
Enhancement measures: None anticipated		
Residual Risks: Reduce carbon emissions through the use of renewable energy and contributing to efforts to reduce global warming		

Nature: Visual impacts and impacts on sense of place Visual impacts and sense of place impacts associated with the operation phase of the Project.		
	Prior to Mitigation	***Post Mitigation***
Duration	Long term (4)	N.A. – Mitigation not possible.
Extent	Local (2)	N.A. – Mitigation not possible.
Magnitude	Low (4)	N.A. – Mitigation not possible.
Probability	Improbable (2)	N.A. – Mitigation not possible.
Significance	**Low Negative (18)**	**N.A. – Mitigation not possible**
Mitigation: In order to successfully reduce the visual impact and the influence on sense of place during the operating phase of the planned project, it is advised that the recommendations provided in the Visual Impact Assessment (Specialist study) be followed in this regard.		
Residual Risks: None anticipated if the visual impact will be removed after decommissioning, provided the Solar PV Energy Facility infrastructure is removed and the site is rehabilitated to its original (current) status		

7.8.4 Overall Result

The proposed Project will create a number of potential socio-economic opportunities and benefits and is unlikely to result in permanent damaging social impacts. **From a social perspective it is concluded that the Project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the Project.**

Based on the social assessment, the following recommendations are made:

- In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled are scarce commodities in the Study Area and could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavors to obtain jobs and provoke discontent as well as put pressure on the local services available. Local labour should be utilised to enhance the positive impact of employment creation in the area, where possible. Local businesses should be involved with the construction activities where possible. It is imperative that local labour be sourced to ensure that benefits accrue to the local communities. Preference should thus be given to the use of local labour during the construction and operational phases of the project as far as possible.
- Locals should also be allowed an opportunity to be included in a list of possible local suppliers and service providers, enhancing the multiplier effect. This aspect would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
- Nuisance Impacts associated with the construction period should be carefully mitigated to minimise any dust and noise pollution.
- Safety and security concerns should be considered during the planning and construction phases of the proposed Project.

Considering the findings of the report and potential for mitigation it is the reasoned opinion of the specialist that the Project can be authorised from a social perspective.

CHAPTER 8: ASSESSMENT OF PONTENTIAL CUMULATIVE IMPACTS

As identified and assessed in Chapter 8, the development of a Solar PV Energy Facility and associated grid connection may have effects (positive and negative) on natural resources, the social environment and on the people living in a Project Area. The preceding impact assessment chapter has reported on the assessment of the impacts associated with the proposed Project largely in isolation (from other similar developments). Cumulative impacts are defined as the total impacts resulting from the successive, incremental, and/or combined effects of a project when added to other existing, planned and/or reasonably anticipated future projects, as well as background pressures (IFC 2013). This chapter assesses the potential contribution of the Project to cumulative impacts on valued environmental and social components.

8.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Environmental Impact Assessment Report

This chapter of the EIA Report includes the following information required in terms of the EIA Regulations, 2014 - Appendix 3: Scope of Assessment and Content of Environmental Impact Assessment Report:

Requirement	Relevant Section
3(j)(i) an assessment of each identified potentially significant impact and risk, including cumulative impacts.	The cumulative impacts associated with the development of the Buffelspoort Solar PV Energy Facility are included and assessed within this chapter.

8.2 Approach taken to Assess Cumulative Impacts

The cumulative impacts that have the potential to be compounded through the development of the Project and its associated infrastructure in proximity to other similar developments include impacts such as those listed below. The role of the cumulative assessment is to confirm if such impacts are relevant to the Buffelspoort Solar PV Energy Facility within the regional setting being considered for the development. This assessment considers whether the cumulative impact will result in:

- Unacceptable loss of threatened or protected vegetation types, habitat, or species through clearing, resulting in an impact on the conservation status of such flora, fauna, or ecological functioning.
- Unacceptable risk to freshwater features through disturbance associated with construction activities and increased runoff and erosion during the operation phase.
- Unacceptable risk to avifauna through habitat loss, and displacement.
- Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion.
- Unacceptable loss of heritage resources (including palaeontological and archaeological resources).
- Complete or whole-scale change in the sense of place and character of an area and unacceptable visual intrusion.
- Unacceptable negative impact to socio-economic factors and components.

Further to the above, positive cumulative impacts are also expected and will be associated with socio-economic aspects and benefits.

It is important to explore the potential for cumulative impacts on a quantitative basis as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by renewable energy developments throughout South Africa, while the significance of the cumulative impact on visual amenity may only be influenced by renewable energy developments that are in closer proximity to each other, e.g., up to 30 km apart. For practical purposes a sub-regional scale of 30 km has been selected for this cumulative impact evaluation. **Table 8.1** and **Figure 8.1** provide details of other operating and proposed renewable energy facilities located within 30 km of the Project Site. These projects were identified using the DFFE Renewable Energy Database and current knowledge of projects operating and being proposed in the area.

Table 8.1: Renewable energy facilities located within the broader area (within a 30 km radius) of the Buffelspoort Solar PV Energy Facility project site

Project Names	EA Number	Project Status	Type	Distance from the proposed site
7 MW PV Plant on the Farm Spruitfontein	Unknown	Authorised	Solar PV	Within a 30km radius
Lonmin Western Plantinum Limited with Madibeng Local Municipality	Unknown	Authorised	Solar PV	Within a 30km radius
Avelar Solar Panel project for International Ferro Metals	Unknown	Authorised	Solar PV	Within a 30km radius
Rustmo3 PV plant North West	Unknown	Authorised	Solar PV	Within a 30km radius
Rustmo4 PV plant North West	Unknown	Authorised	Solar PV	Within a 30km radius
Expansion of the Co-generation plant	Unknown	Authorised	Solar PV	Within a 30km radius
Construction of PV Solar Panels on the Rietpoort 395 IQ Mogale City local Municipality	Unknown	Authorised	Solar PV	Within a 30km radius
Construction of the Rustmo2 PV plant on a site near Buffelspoort, Rustenburg local Municipality	Unknown	Authorised	Solar PV	Within a 30km radius

In the case of the Project, there are eight (8) renewable energy facilities, located within a 30km radius of the project site (refer to **Figure 8.1** and **Table 8.1**). These facilities listed in **Table 8.1** have already received authorisation. The potential for cumulative impacts is summarised in the sections which follow and has also been considered within the specialist studies (refer to **Appendices D – I**).

It should be noted that not all approved renewable energy developments being considered by various IPPs will be built for operation. Not all approved developments will be granted the relevant permits by the relevant authorities (DFFE, DMRE, NERSA and Eskom) and this is because of the following reasons:

» There may be limitations to the capacity of the existing or future Eskom grid.
» Not all applications will receive a positive Environmental Authorisation.
» There are stringent requirements to be met by applicants in terms of the REIPPP Programme and private off-taker bids, and a highly competitive process that only selects the best projects.

- Not all proposed projects will be viable because of lower renewable resources on some sites.
- Not all proposed projects will be able to reduce the associated negative impacts to acceptable levels or be able to mitigate the impacts to acceptable levels (fatally flawed).
- Not all proposed facilities will eventually be granted a generation license by NERSA and sign a Power Purchase Agreement with Eskom.
- Not all developers will be successful in securing financial support to advance their projects further.

As there is uncertainty whether all the above-mentioned renewable energy projects will be implemented, it is also difficult to quantitatively assess the potential cumulative impacts. The cumulative impacts of other known renewable energy projects in the broader area and the Project are therefore qualitatively assessed in this Chapter.

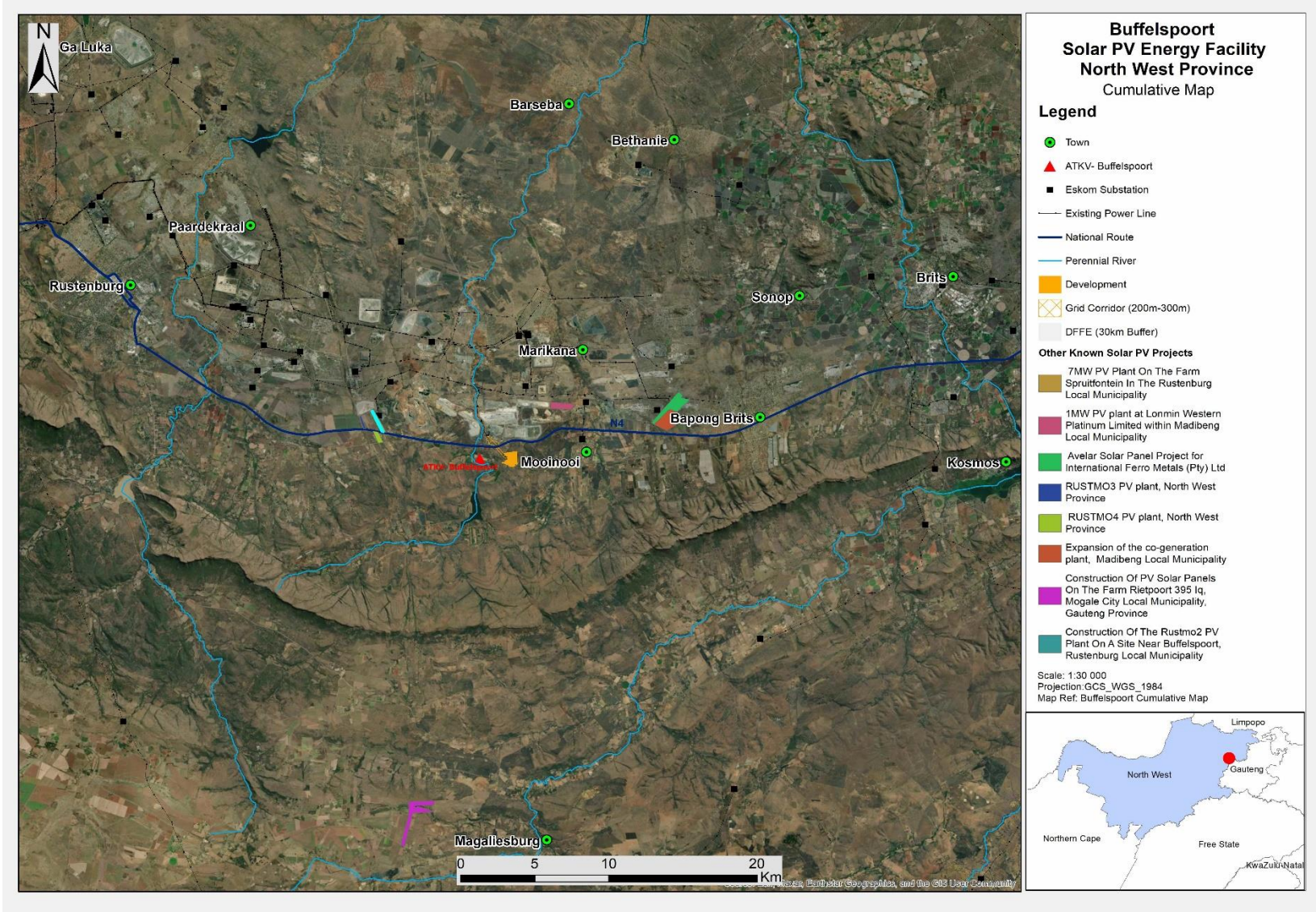


Figure 8.1: Cumulative map illustrating other approved and/or constructed renewable energy facilities located within a 30km radius of the Project Site

8.3 Cumulative Impacts on Terrestrial Ecology

Impact Nature: Cumulative habitat loss within the region The development of the proposed infrastructure will contribute to cumulative habitat loss within ESAs and thereby impact the ecological processes in the region.		
	Overall impact of the proposed development considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local Area (3)	Regional (4)
Duration	Moderate term (3)	Long term (4)
Magnitude	Moderate (6)	High (8)
Probability	Probable (3)	Probable (3)
Significance	**Medium (15)**	**Medium (19)**
Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	To some degree, but most of the impact results from the presence of the various facilities which cannot be well mitigated.	
Mitigation: Ensure that a rehabilitation plan and IAP management plan be compiled and are effectively implemented for the proposed Project.		

8.4 Cumulative Impact on Avifauna

Nature: Loss of habitat and increase in bird collisions		
	Project in isolation	**Project with adjacent PV projects with associated infrastructure**
Extent	Local area (3)	Regional (4)
Duration	Moderate Term (3)	Long Term (4)
Magnitude	Moderate (6)	High (8)
Probability	Probable (3)	Probable (3)
Significance	**Medium (36)**	**Medium (48)**
Status (positive or negative)	Negative	Negative
Reversibility	None	None
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	
Mitigation: » Ensure that a rehabilitation plan and IAP management plan are compiled and are effectively implemented. » Also ensure all the bird diverters and electrocution mitigations listed above are implemented.		
Residual Impacts: Loss of habitat for endemic and SCC. Loss of SCCs due to collisions.		

8.4 Cumulative Impact on Soils and Agricultural Potential

Nature: *Loss of land capability*		
	Without mitigation	**With mitigation**
Extent	Regional (4)	Local area (3)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (42)**	**Low (22)**

Status (positive or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- General mitigations will ensure the conservation of all soil resources, regardless of the sensitivity of resources and the intensity of impacts.
- Only the proposed access area and roads should be cleared for development to reduce any unnecessary compaction;
- Take precautionary measures when working with machinery, equipment and vehicles on site to prevent any spills onto raw soils. Vehicles, equipment and machines must be parked on an impermeable surface (or a drip tray fitted under each machine) and should be checked daily for hydrocarbon leaks;
- All top -and subsoil must be stored appropriately in accordance with a Top Soil Management Plant for use during rehabilitation of eroded areas
- In the event of a hydrocarbon spill on raw soil, it is required that the spill be cleaned up immediately and the contaminated soil disposed of accordingly.

Residual Impacts:
Limited residual impacts will be associated with these activities, assuming that all prescribed mitigation measures be strictly adhered to.

8.5 Cumulative Impact on Heritage Resources (including archaeology, palaeontology and cultural landscape)

Nature: Historical Structures have been identified during the survey. These sites were rated as **not conservation worthy (NCW)** and of no heritage significance. Cumulative impacts on historical resources would occur during the construction and operation phase.

	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Low (1)	Low (1)
Duration	Long-term (4)	Long-Term (4)
Magnitude	Minor (2)	Minor (1)
Probability	Probable (3)	Unlikely (2)
Significance	**Low (21)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

Mitigation:
Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.

Therefore, no cumulative impact is expected to occur.

Residual Impacts:
Considering the nature of the sites identified in the present study, the residual risk will be minimal.

Nature: Archaeological resources have been identified during the survey. These sites are of moderate significance and rated as IIIB. Cumulative impacts to historical resources would occur during the construction and operation phase.

	Without mitigation	**With mitigation**
Extent	Low (1)	Low (1)
Duration	Long term (4)	Long Term (4)
Magnitude	Minor (2)	Minor (1)
Probability	Probable (3)	Unlikely (2)
Significance	**Low (21)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is possible that the impact could lead to the irreplaceable loss of archaeological resources.		
Residual Impacts: Considering the nature of the sites identified in the present study, the residual risk will be moderate.		

Nature: Graves and Burial Grounds have been identified during the survey. These sites are of high significance and rated as IIIA. Cumulative impacts to Burial Grounds and graves resources would occur during the construction and operation phase when.		
	Overall impact of the proposed project considered in isolation	***Cumulative impact of the project and other projects in the area***
Extent	Low (1)	Low (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Low (3)
Probability	Unlikely (2)	Unlikely (2)
Significance	**Low (14)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
The irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is possible that the impact could lead to the irreplaceable loss of burial grounds and graves.		
Residual Impacts: Considering the nature of the sites identified in the present study, the residual risk will be moderate.		

8.6 Cumulative Visual Impact

Besides the large number of mines and mining infrastructure within the Study Area, there are numerous powerlines and substations, predominantly associated with the mines. There are no airports or airfields within the Study Area. Additionally, despite the other authorised or operational solar energy facilities within the Study Area, the constrained visual exposure of the proposed Buffelspoort Solar PV Energy Facility, the built-up and transformed nature of the Study Area (i.e., the presence of mining and industrial infrastructure especially to the north) is expected to absorb potential cumulative visual impacts (generally experienced in more natural settings). It is unlikely that the additional PV facilities would be visible from each other, or collectively from potential sensitive visual receptor sites.

8.7 Cumulative Social Impact

Nature: An increase in employment opportunities, skills development and business opportunities with the establishment of more than one solar energy facility.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local -regional (3)	Local-regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Medium Probability (3)	Medium Probability (3)
Significance	**Moderate (33)**	**Moderate (52)**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impacts be mitigated?	Yes	Yes
Confidence in findings: High.		
Mitigation: » The establishment of solar energy facility in the area does have the potential to have a positive cumulative impact on the area in the form of opportunity for employment seekers to improve their skills and permanent employment during operational phase. » The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the Project Proponent to maximise the project opportunities available to the local community.		

Nature: Positive impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (2)	Local-regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Low (4)
Probability	Improbable (1)	Low Probability (2)
Significance	**Low (7)**	**Low (22)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: » Develop a recruitment policy / process (to be implemented by contractors), which will ensure the sourcing of labour locally, where available. » Develop and implement a recruitment protocol in consultation with the municipality and local community leaders. Ensure that the procedures for applications for employment are clearly communicated.		

Nature: Visual impact on sense of place and landscape character.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (2)	Local-regional (3)

Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Medium Probability (3)	Medium Probability (3)
Significance	**Low (27)**	**Medium (39)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	No, only best practice measures can be implemented	
Confidence in findings: High.		
Mitigation: » To effectively mitigate the visual impact during the operational phase of the proposed Project, It is suggested that the recommendations made in the Visual Impact Assessment (Specialist study) should be followed in this regard.		

8.8 Conclusion regarding Cumulative Impacts

Cumulative impacts are expected to occur with the development of the Project throughout all phases of the project life cycle and within all areas of study considered as part of this EIA report. The following conclusions can be drawn regarding the cumulative impacts associated with the project:

- There will be no unacceptable loss or impact on ecological aspects (vegetation types, species and ecological processes) due to the development of the Project and other renewable energy projects within the surrounding area, provided the recommended mitigation measures are implemented. The cumulative impact is therefore acceptable.
- There will be no significant loss of sensitive and significant aquatic features. The cumulative impact is therefore acceptable.
- There will be no unacceptable risk to avifauna with the development of the Project and other renewable energy projects within the surrounding area, provided the recommended mitigation measures are implemented. The cumulative impact is therefore acceptable.
- The cumulative impact from a land capability perspective is considered to be acceptable provided the recommended mitigation measures are implemented.
- Change to the sense of place and character of the area is expected with the development of the proposed Project and other renewable energy facilities within a 30km radius of the site. Other large scale industrial operations including mining operations are relatively obvious in the region. Whilst the proposed project will create a new large scale industrial operation and change the character of an area of rural landscape, this is not entirely out of character with the region. The cumulative impact is therefore considered to be acceptable.
- There will be no unacceptable loss of heritage resources associated with the development of the Project.
- No unacceptable social impacts are expected to occur. Positive cumulative impacts are expected to occur from a social perspective and are expected to be beneficial at a regional level. The cumulative impact is therefore acceptable.

Based on the specialist cumulative assessment and findings, the development of the Project and its contribution to the overall impact of all renewable energy projects to be developed within a 30km radius, it can be concluded that the Project will not result in unacceptable, high cumulative impacts and will not result in a whole-scale change of the environment.

CHAPTER 9: CONCLUSIONS

Buffelspoort Solar Project (Pty) Ltd is proposing to develop, construct and operate a Solar PV Energy Facility and associated infrastructure on a site located approximately 6km west of Mooinooi within the Rustenburg Local Municipality (RLM) of the Bojanala Platinum District Municipality (BPDM) in the North West Province. The facility will have a contracted capacity of up to 40 MWp and will be known as the Buffelspoort Solar PV Energy Facility.

The Project Site considered to be suitable for the development of a solar facility and associated infrastructure, with an extent of approximately 223ha, was identified by the Project Developer. The preferred Development Footprint (~77ha) is the area under assessment in the Environmental Impact Assessment (EIA) process. It is within the identified Project Site that a Development Footprint has been identified by the Project Developer through consideration of the sensitive environmental features and buffers identified during the Scoping Phase and as part of the Specialist environmental investigations. The Project Site consists of sixteen (16) affected properties, which include:

Solar PV Energy Facility:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 134 of Farm Buffelspoort 343JQ

Grid Connection Corridor:
» Portion 75 of Farm Buffelspoort 343JQ
» Portion 88 of Farm Buffelspoort 343JQ
» Portion 89 of Farm Buffelspoort 343JQ
» Portion 101 of Farm Buffelspoort 343JQ
» Portion 119 of Farm Buffelspoort 343JQ
» Portion 120 of Farm Buffelspoort 343JQ
» Portion 121 of Farm Buffelspoort 343JQ
» Portion 122 of Farm Buffelspoort 343JQ
» RE of Portion 101 of Farm Kafferskraal 342JQ
» Portion 148 of Farm Kafferskraal 342JQ
» Portion 236 of Farm Kafferskraal 342JQ
» Portion 303 of Farm Kafferskraal 342JQ
» Portion 374 of Farm Kafferskraal 342JQ
» Portion 376 of Farm Kafferskraal 342JQ

The Development Footprint of ~ 77ha will contain the following infrastructure to enable the Buffelspoort Solar Energy Facility to generate up to 40MWp:

» Solar PV arrays comprising PV panels and mounting structures.
» Inverters and transformers.
» Cabling between the arrays.
» Onsite facility substation.
» 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.

- Battery Energy Storage System (BESS)[18] – to be initiated at a later stage than the Solar PV Energy Facility.
- Temporary laydown area.
- Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
- Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.
- Fencing around the site, including an access gate.

Buffelspoort Solar Project (Pty) Ltd has confirmed that the Development Footprint is particularly suitable for solar facility development from a technical perspective due to the quality of the prevailing solar resource, compatibility with the current land use and land availability.

9.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Environmental Impact Assessment

This chapter of the EIA Report includes the following information required in terms of Appendix 3: Content of the Environmental Impact Assessment Report:

Requirement	Relevant Section
3(1)(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report.	A summary of the findings of the specialist studies undertaken for the Project has been included in section 9.2.
3(1)(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts of the Project has been included as section 9.9. An Environmental Sensitivity and Layout map of the Project has been included as **Figure 9.1** which overlays the development footprint (as assessed within the EIA) of the Buffelspoort Solar PV Energy Facility and associated infrastructure with the environmental sensitive features located within the Development Area. A summary of the positive and negative impacts associated with the Project has been included in section 9.2.
3(1)(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation of the Project has been included in section 9.10.
3(1)(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	A reasoned opinion as to whether the Project should be authorised has been included in section 9.10

[18] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

9.2 Evaluation of the Buffelspoort Solar PV Energy Facility

The preceding chapters of this report together with the specialist studies contained within **Appendices D-J** provide a detailed assessment of the potential impacts that may result from the development of the Project. This chapter concludes the environmental assessment of the Project by providing a summary of the results and conclusions of the assessment of both the Project Site and Development Footprint for the Buffelspoort Solar PV Energy Facility and associated infrastructure. In so doing, it draws on the information gathered as part of the EIA process, the knowledge gained by the environmental specialists and the EAP and presents a combined and informed opinion of the environmental impacts associated with the Project.

No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented. These measures include, amongst others, the avoidance of sensitive features within the development area as specified by the specialists.

The potential environmental impacts associated with the Project assessed through the EIA process include:

» Impacts on terrestrial ecology (flora and fauna).
» Impacts on aquatic ecology.
» Impacts on avifauna.
» Impacts on land use, soils, and agricultural potential.
» Impacts on heritage resources, including archaeology, palaeontology and the cultural landscape.
» Visual impacts on the area imposed by the components of the facility.
» Positive and negative social impacts.

The environmental sensitivities identified by the relevant specialists for the Project Site are illustrated in **Figure 9.1.** The Development Footprint, as assessed, has been overlain with the relevant environmental sensitivities.

9.2.1 Impacts on Ecology

The Project Site is situated within the Savanna Biome. The savanna vegetation of South Africa represents the southern-most extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna Biome include a seasonal precipitation and a sub-tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

The Savanna Biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over topped by a discontinuous, but distinct woody plant layer (Mucina & Rutherford, 2006). At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (*microphyllous*) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by *microphyllous* woody plants of the Mimosaceae family (Common genera include *Vachellia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

The present land use had a direct impact on both the fauna and the flora in the area, which is evident in the disturbed and transformed habitats. Historically, land clearing and the subsequent mismanagement has led to the deterioration of most of the area to a disturbed habitat that has not recovered since.

However, the degraded Bushveld habitat in the wider project area can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by development.

The degraded Bushveld habitat in the Project Site has a **High ecological theme sensitivity**.

The habitat sensitivity of the degraded Bushveld and wetland/water resources is regarded as high and medium respectively, due to the species recorded and the role of this intact unique habitat to biodiversity within a very fragmented local landscape, not to mention the sensitivity according to various ecological datasets.

The high sensitivity terrestrial areas still:
» Support nearby CBA/ESAs as per the conservation plan (NWBSP);
» Viable constituent of and EN ecosystem, NPAES, IBA and Biosphere Reserve; and
» Support various organisms and may play an important role in the ecosystem, if left to recover from the superficial impacts.

The ecological integrity, importance and functioning of these terrestrial biodiversity areas provide a variety of ecological services considered beneficial, with one key service being the maintenance of biodiversity. The preservation of these systems is the most important aspect to consider for the proposed Project.

Development in high sensitivity areas must be avoided, which will occur with the selection of the Project Site. Development within the high sensitivity areas within the Project Site will lead the direct destruction and loss of functional habitats; and the faunal species that are expected to utilise this habitat. Thus, if these areas are not maintained in a natural or near natural state, destroyed or fragmented, then meeting targets for biodiversity features will not be achieved. The mitigation measures, management and associated monitoring regarding the expected impacts will be the most important factor of this Project.

The main expected impacts of the proposed Project will include:

» Habitat loss and fragmentation;
» Degradation of surrounding habitat;
» Disturbance and displacement caused during the construction and maintenance phases; and
» Direct mortality during the construction phase.

Mitigation measures as described in this report can be implemented to reduce the significance of the risk. Considering that this area that has been identified as being of significance for biodiversity maintenance and ecological processes, development may proceed but with caution and only with the implementation of mitigation measures.

Considering the above-mentioned information, no fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

9.2.2 Impacts on Aquatic Ecology

During the site visit, four (4) HGM units were identified within the 500 m regulated area. The wetland areas were delineated in accordance with the DWAF (2005) guidelines. Two (2) HGM units have been identified as depression wetlands, one (1) has been identified as a hillslope seep wetland and one (1) as a unchannelled valley bottom wetland. Along with the wetlands multiple drainage features as well as artificial wetlands and a few dams were also delineated. Although these systems do not classify as a natural wetland system it is important to note where they are and to preserve them.

The depression and hillslope seep wetlands scored a "Low" importance and sensitivity score due to the low protection level in the ecosystem as it is location in the agricultural fields meaning that the wetland will be stripped from all hydrophyte vegetation which limits its ability to contribute to biodiversity maintenance and to provide habitat for species. The average ecosystem service score ranges between "Moderately Low" and "Moderately High".

A 15 m post mitigation buffer was assigned to the wetland systems.

Based on the results and conclusions presented in this section of the report, it is expected that the proposed activities will have low residual impacts on the wetlands and thus no fatal flaws were identified for the Project. A General Authorisation (GN 509 of 2016) is required for the water use authorisation.
The following Zones of Regulation (ZoR) are applicable to the drainage line identified within the assessment area:

» A 32 m Zone of Regulation in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) should be assigned to the drainage lines; and
» A 100 m ZoR in accordance with the National Water Act, 1998 (Act No. 36 of 1998) should be assigned to the drainage lines.

9.2.2 Impact on Avifauna

During the field assessment fifty-seven (57) bird species were recorded in the point counts of the survey, while thirty-six (36) species were recorded during incidental observations. None of the species recorded were SCC. The species recorded were generalist species, this is somewhat of a concern for an area that is a nature reserve. It is likely that the low number of species could be attributed to the season of the survey. The low number of water birds recorded is likely attributed to poor water quality in both the man-made dams on site and in the nearby Sterkstroom river. Only three (3) types of water birds were observed at three (3) dams and along two points of the Sterkstroom.

The different habitat types within the Development Footprint were delineated and identified based on observations during the field assessment as well as available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern and their ecosystem processes. The sensitivities were compiled for the avifauna study based on the one survey. All habitats within the Development Footprint were allocated a sensitivity category. The water resources in the area are of high ecological importance not only as a source of water but also because of the unique habitat they offer in the area surrounding them. The Degraded Bushveld had a unique assemblage of bird species due to the rocky outcrops found in this area, but as no species of conservation concern (SCC) were recorded the site sensitivity was rated as Medium. The Disturbed Bushveld had a composition of bird species that are adapted to change and disturbance as such the site sensitivity was rated as Low.

The proposed Project will have a high or medium impact on the avifauna which, in most instances, could be reduced to a lower impact through appropriate mitigation. Based on the current types of bird species recorded in the Development Footprint the proposed Project will not have a high residual impact should all the mitigations and recommendations be implemented.

No fatal flaws are evident for the proposed Project. It is the opinion of the specialists that the proposed Project, may be favourably considered, on condition that all prescribed mitigation measures and supporting recommendations are implemented.

9.2.3 Impacts on Land Use, Soils and Agricultural Potential

The most sensitive soil forms identified within the Project Site is the Hutton and Tukulu soil forms, with other associated soils also occurring. The Hutton soil form consists of an orthic topsoil horizon on top of a thick red apedal subsurface diagnostic horizon below. The Tukulu soil form consists of an orthic topsoil on top of a thick neocutanic horizon underlain with gleyic horizon.

The land capability of the above-mentioned soils has been determined to have land capability classes of "II" and "III" with a climate capability level 8 given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capabilities and climate capabilities results in land potentials "L5" and "L6". The "L5" land potential level is characterised by a restricted potential. Regular and/or moderate to severe limitations occur due to soil, slope, temperatures or rainfall. The "L6" land potential level is characterised by a very restricted potential. Regular and/or severe limitations occur due to soil, slope, temperatures or rainfall. These areas are non-arable. The "L5" and "L6" land potential are characterized with a "Low Sensitivity".

The land capability sensitivity (DAFF, 2017) indicates a range of sensitivities expected throughout the Project Site, which predominantly covers "Moderately Low" to "Moderate" sensitivities. Smaller patches are characterised by sensitivities up to "Moderately High". Furthermore, various crop field boundaries were identified by means of the DEA Screening Tool (2022), which indicated that the grid connection corridor is predominantly characterised by "High" sensitivity crop fields. It is mainly recommended that high sensitivity crop field be avoided. However, in the event that relocating of the Project Site is not feasible, stakeholders should undertake an evaluation of possible agreement with the landowners prior to any development in those areas.

The Project Site is associated with both arable and non-arable soils. However, the available climatic conditions of low annual rainfall and high evapotranspiration potential severely limits crop production significantly resulting in land capabilities with "Low" and "Moderate high" sensitivities. The land capabilities associated with the Project Site are suitable for cropping and grazing, which corresponds with the current land use.

The final results indicate "Low" post-mitigation significance ratings for the proposed Project. It is therefore clear that the proposed Project is expected to have a low impact on land potential resources. It is the specialist's opinion that the proposed Project will have no impacts on the agricultural production ability of the land and therefore may be favourably considered.

9.2.4 Impacts on Heritage Resources (incl. archaeology and palaeontology)

During the fieldwork, a total of seven (7) heritage features and resources where identified. These consist of one (1) burial ground with approximately 100 graves, three (3) localities with recent historic structures and one (1) kraal, as well as two (2) low to moderate significance archaeological sites.

Archaeological Resources

The two archaeological sites identified, are characterised by large areas of stonewalling (BFP-01 and BFP-03). Site BFP-01 consists of a long continuous stone wall running along a raised outcrop, although no other cultural material was identified within the proposed Development Footprint. The Project Developer has excluded this site employing buffers put in place for the layout of the solar energy facility. Site BFP-03 is a large stone wall site with numerous stone-walled enclosures. It appears the area was already disturbed as it now functions as a feeding ground for the game in the area. There is evidence of some of the stonewalling being destroyed whereas others still appear to be in their original state, no other cultural material was identified in the area. It is located just outside (at the north-eastern corner) of the proposed Development Footprint.

The sites BFP01 and BFP03 have a low and moderate heritage significance respectively and a heritage rating of IIIC and IIIB.

Burial Grounds and Graves

A single burial ground consisting of approximately 100 graves was identified at site BFP-02. The site was indicated to the fieldwork team by the owner of the property. The informal graveyard lies just outside (west) the proposed Development Footprint. Although the area is overgrown by vegetation, some of the graves are still identifiable and consist mainly of stone-packed or stone-lined grave dressings, except for a few concrete or marble grave dressing features. Due to the cultural and religious significance of burial grounds, the site is graded as Grade IIIA.

The site BFP-02 has a high heritage significance and heritage rating of IIIA. This site has high heritage sensitivity.

Historical Structures

The recent historic structures (BFP-04, BFP-06 and BFP-07) and the kraal (BFP-05) are all younger than 60 years and vary in preservation. They are all currently abandoned. The structures and remains of structures are not conservation worthy and contain no cultural or scientific value and are consequently graded as not conservation worthy (NCW).

BFP-04, BFP-05, BFP-06 and BFP-07 were rated as not conservation worthy and of no heritage significance.

Palaeontology

According to the PalaeoMap of SAHRIS, the Palaeontological Sensitivity of the proposed Development Footprint is zero or insignificant

Overall conclusion

Heritage resources are present within the Development Footprint of the Buffelspoort Solar PV Energy Facility. The initial projected impact is rated as LOW to HIGH on these heritage resources before mitigation measures. Through the combination of the various environmental, cultural, and socio-economic

sensitivities, the client can develop a layout option that will reduce the impact on the heritage resources. The proposed layout reduces the impact on the heritage resource identified to LOW.

9.2.6 Visual Impacts

The findings of the Visual Impact Assessment undertaken for the proposed Buffelspoort PV Solar facility and its associated infrastructure is that the visual environment surrounding the site, especially within a 1km radius (and potentially up to a radius of 3km) of the proposed facility, may be visually impacted during the anticipated operational lifespan of the facility (i.e. a minimum of 15 years).

The following is a summary of impacts remaining, assuming mitigation as recommended, is exercised:

- During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and residents in the area. Construction activities may potentially result in a high, temporary visual impact, that may be mitigated to moderate.
- The Solar PV Energy Facility is expected to have a high visual impact pre-mitigation and a moderate visual impact post mitigation on residents of homesteads and observers travelling along the R104 and N4 within a 1 km radius.
- The operational Solar PV Energy Facility could have a moderate visual impact on observers travelling along the R104 and residents at homesteads north south of the N4 including visitors to the AKTV resort within a 1 – 3km radius of the Solar PV Energy Facility structures. This impact may be mitigated to low.
- The anticipated impact of lighting at the Solar PV Energy Facility is likely to be of moderate significance and may be mitigated to low.
- The potential visual impact related to solar glint and glare as a road travel hazard is expected to be of moderate significance mitigated to low significance.
- There are a fair number of residences located within a 1km radius of the Solar PV Energy Facility. The potential visual impact related to solar glint and glare on static ground-based receptors (residents of homesteads) is therefore expected to be of low significance, both before and after mitigation.
- The anticipated visual impact resulting from the construction of on-site ancillary infrastructure is likely to be of moderate significance both before and after mitigation.
- The anticipated visual impact of the proposed Solar PV Energy Facility on the regional visual quality (i.e. beyond 6km of the proposed infrastructure), and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of low significance.

The anticipated visual impacts listed above (i.e. post mitigation impacts) range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed Solar PV Energy Facility are not considered to be fatal flaws for the proposed Project. Considering all factors, it is recommended that the development of the Solar PV Energy Facility as proposed be supported, subject to the implementation of the recommended mitigation measures and management programme.

9.2.7 Impact on the Social Environment

Impacts are expected to occur with the development of Buffelspoort Solar PV Energy Facility during the construction, operation and decommissioning phases. Both positive and negative impacts are identified and assessed.

Potential Social Impacts during the Construction Phase

The positive and negative social impacts identified and assessed for the construction phase includes:

» Creation of direct and indirect and induced employment opportunities
» Economic multiplier effects
» Industry stimulation
» Influx of jobseekers and change in population structure
» Safety and security impacts
» Impacts on daily living and movement patterns
» Nuisance impacts, including noise and dust

Potential Social Impacts during the Operation Phase

It is anticipated that the Project will operate for approximately 15 years, or as long as required by the private off-taker.

The potential positive and negative social impacts that could arise because of the operation of the proposed project include the following:

» Direct and indirect employment opportunities
» Development of renewable energy infrastructure
» Visual impact and sense of place impacts

The proposed Project will create a number of potential socio-economic opportunities and benefits and is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the Project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the Project.

Based on the social assessment, the following recommendations are made:

» In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled are scarce commodities in the study area and could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavors to obtain jobs and provoke discontent as well as put pressure on the local services available. Local labour should be utilised to enhance the positive impact of employment creation in the area. Local businesses should be involved with the construction activities where possible. It is imperative that local labour be sourced to ensure that benefits accrue to the local communities. Preference should thus be given to the use of local labour during the construction and operational phases of the project as far as possible.
» Locals should also be allowed an opportunity to be included in a list of possible local suppliers and service providers, enhancing the multiplier effect. This aspect would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
» Nuisance Impacts associated with the construction period should be carefully mitigated to minimise any dust and noise pollution.

» Safety and security concerns should be considered during the planning and construction phases of the proposed Project.

Considering the findings of the report and potential for mitigation it is the reasoned opinion of the specialist that the Project can be authorised from a social perspective.

9.2.8 Assessments of Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of several renewable energy facilities in South Africa. The degree of significance of these cumulative impacts is difficult to predict without detailed studies based on more comprehensive data/information on each of the receptors and the site-specific developments. The alignment of renewable energy developments with South Africa's National Energy Response Plan and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The economic benefits of renewable energy developments at a local, regional and national level have the potential to be significant.

The are several authorised renewable energy projects within a 30km radius of the proposed site, namely:

» 7 MW PV Plant on the Farm Spruitfontein
  » Lonmin Western Plantinum Limited with Madibeng Local Municipality
  » Avelar Solar Panel project for International Ferro Metals
  » Rustmo3 PV plant North West
  » Rustmo4 PV plant North West
  » Expansion of the Co-generation plant
  » Construction of PV Solar Panels on the Rietpoort 395 IQ Mogale City local Municipality
  » Construction of the Rustmo2 PV plant on a site near Buffelspoort, Rustenburg local Municipality

All cumulative impacts associated with the Project are expected to be of a medium or low significance, with impacts of a high significance associated with the visual impacts. A summary of the cumulative impacts is included in **Table 9.1** below.

Table 9.1: Summary of the cumulative impact significance for the Buffelspoort Solar PV Energy Facility

Specialist Assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology	Medium	Medium
Aquatic Ecology	Low	Low
Avifauna	Medium	Medium
Soil, Land use, and agricultural potential	Medium	Low
Heritage (including archaeology, palaeontology and sense of place)	Low	Low
Visual	High	High
Socio-Economic	Positive impacts: Low Negative impacts:	Positive impacts: Medium Negative impacts:

Specialist Assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
	Medium or Low (depending on the impact being considered)	Medium or Low (depending on the impact being considered)

Based on the specialist cumulative assessment and findings, the development of the Project and its contribution to the overall impact of all renewable energy projects to be developed within a 30km radius, it can be concluded that the contribution of the project to cumulative impacts will be of a medium to low significance, with impacts of a high significance mainly relating to visual impacts on the landscape. Therefore, it was concluded that the development of the Project will not result in unacceptable, high cumulative impacts and will not result in a whole-scale change of the environment.

9.8 Optimisation of the Layout

Taking into consideration the solar resource, proximity to the off-taker and point of interconnection, land availability and suitability, geographical and topographical location, access to road infrastructure and proximity to towns with a need for socio-economic upliftment, the development of the Project within the Development Footprint is considered to be desirable. The Development Footprint within which the facility is proposed is sufficient in extent for the installation of a solar PV facility, while allowing for the avoidance of environmental site sensitivities. Similarly, the power line corridor identified is sufficient for the placement of the power line while allowing for the avoidance of environmental sensitivities. To ensure avoidance of these sensitive environmental features, the facility layout has been optimised by the Project Developer as illustrated in **Figure 9.2**. This approach ensures the application of the mitigation hierarchy (i.e., avoid, minimise, mitigate and offset) to the Buffelspoort Solar PV project, which ultimately ensures the avoidance, reduction and/or mitigation of all identified detrimental or adverse impacts on sensitive features as far as possible.

In summary the Environmental sensitivities identified include:

- Degraded bushveld
- Heritage features
- Wetland systems
- Rocky outcrop

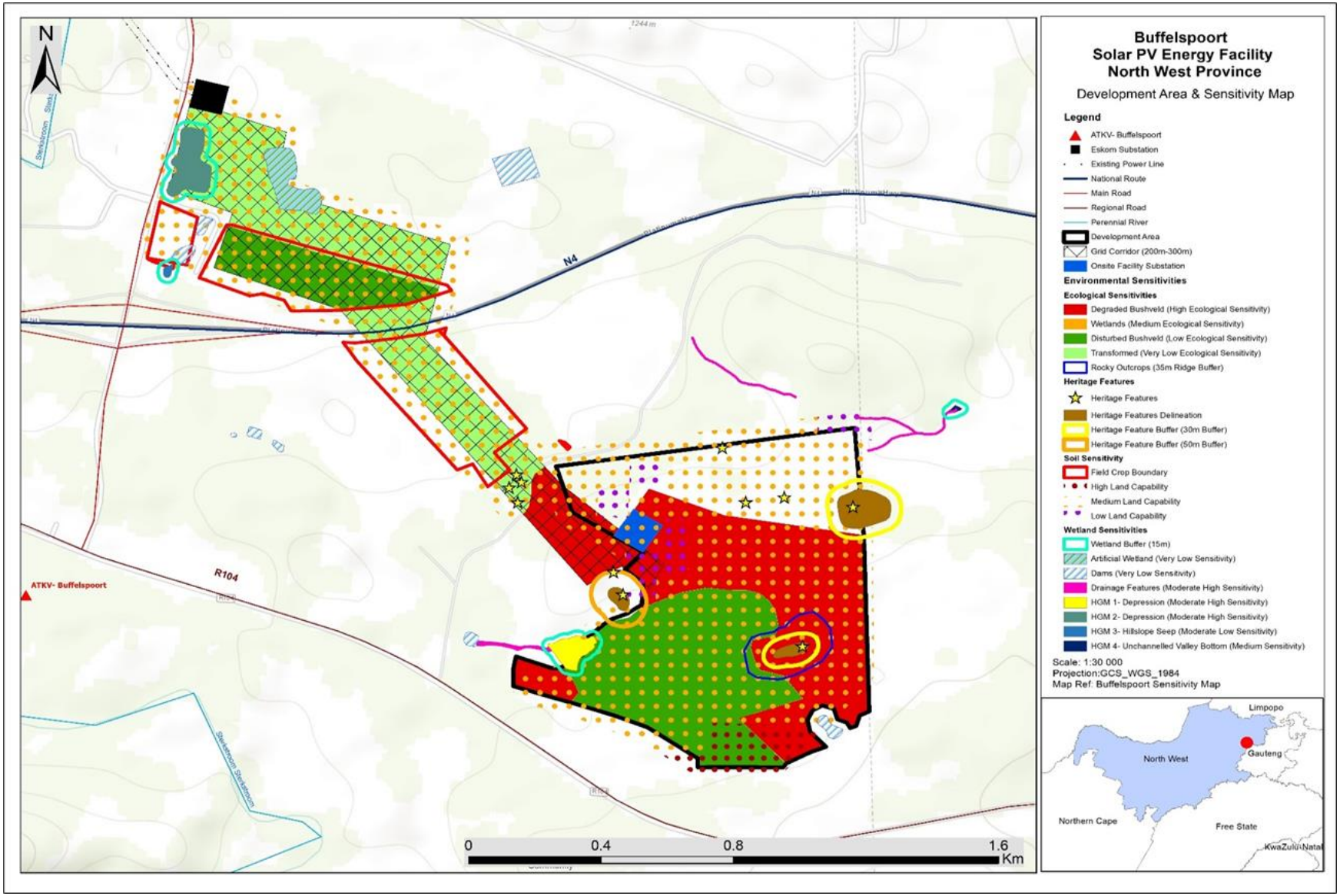


Figure 9.1 The Development Footprint (up to ~77ha) of the Buffelspoort Solar PV Energy Facility, as assessed within this EIA report, overlain on the identified environmental sensitive features (refer to **Appendix M** for A3 Map)

9.9 Environmental Costs versus Benefits of the Project

Environmental costs (including those to the natural environment, economic and social environment) can be anticipated at a local and site-specific level and are considered acceptable provided the mitigation measures as outlined in the EIA Report and the EMPr are implemented and adhered to. No fatal flaws have been identified. These environmental costs could include:

- Loss of biodiversity, flora and fauna due to the clearing of land for the construction and utilisation of land for the Solar PV Energy Facility - The cost of loss of biodiversity has been minimised/avoided through the limited placement of project components and infrastructure within the ecological features, and sensitive areas considered to be of high sensitivity.
- Impact on avifauna - The current types of bird species recorded in the Development Footprint will not have a high residual impact should all the mitigations and recommendations be implemented.
- Impacts on aquatic resources – The Project will not result in any direct impacts on water resources and as a result has a low residual impact on aquatic ecology.
- Visual impacts associated with the Project - The Project will be visible and mainly of a high significance within 0 to 3km distance from the site. No mitigation of this impact is possible (i.e., the structures will be visible in the landscape), but general mitigation and management are required as best practise to minimise secondary visual impacts which may arise from mismanagement of the site.
- Loss of land for agriculture – The overhead power line is proposed to transect some high sensitivity crop fields, but it is expected that impacts can be reduced through appropriate placement of infrastructure. With mitigation, the proposed Project will have a low impact on the land potential resources.
- Negative impact to the Heritage resources – Various heritage resources are within the Development Area including archaeological resources and burial grounds and graves which are rated as having a high heritage significance and will require further mitigation work before the Project can continue. Implementation of the recommended management and mitigation measures can reduce the impact rating to Low.

Benefits of the Project include the following:

- The Project will result in important economic benefits at the local and regional scale through job creation, income and other associated downstream economic development. These will persist during the pre-construction, construction, operation and decommissioning phases of the Project.
- The Project contributes towards the Provincial and Local goals for the development of renewable energy as outlined in the respective IDPs.
- The Buffelspoort Solar PV Energy Facility is a climate friendly development. The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through reducing greenhouse gas (GHG) emissions. South Africa is estimated to be responsible for ~1% of global GHG emissions and currently ranked 9th worldwide in terms of per capita CO2 emissions.

The private offtaker will contribute towards pollution reduction as it will not entail the release of by-products through the burning of fossil fuels for electricity generation, but will utilise a renewable energy resource, in this case solar radiation.

- The Project will improve the grid stability as the private offtake will be less depended on the Eskom Energy supply.

The benefits of the Project are expected to occur at a national, regional, and local level. As the costs to the environment at a site-specific level have been largely limited through the appropriate placement of infrastructure in the development area within medium and low sensitive areas, and through the avoidance of features and areas considered to be of high and very high sensitivity, the benefits of the Project are expected to partially offset the localised environmental costs of the Project.

9.9 Overall Conclusion (Impact Statement)

A technically viable Development Footprint for the Project was proposed by Buffelspoort Solar Project (Pty) Ltd and assessed as part of the EIA process. The environmental assessment of the Development Footprint was undertaken by independent specialists and their findings have informed the results of this EIA Report. Buffelspoort Solar Project (Pty) Ltd has proposed a technically viable layout for the Project and associated infrastructure, which has been assessed as part of the independent specialist studies.

From a review of the relevant policy and planning framework, it was concluded that the Project is well aligned with the policy framework, and a clear need for the Project is seen from a policy perspective at a local, provincial and National level.

The Specialists considered desktop data, results from field work, existing literature and the National Web-based Environmental Screening Tool to inform the identification of sensitivities. The specialist findings have concluded that there are no identified environmental fatal flaws associated with the implementation of the Project. The impacts that are expected to remain after the avoidance of the sensitive areas have been reduced through the recommendation of specific mitigation measures by the specialists. The minimisation of the significance of the impacts is in line with tier 2 of the mitigation hierarchy.

Therefore, it is concluded that impacts can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. This is however not relevant for the visual impact of the Project as the PV modules and associated infrastructure will be visible within 0 to 3km of the site regardless of the mitigation applied. This high significance rating is, however, not considered as a fatal flaw by the specialist.

As detailed in the cost-benefit analysis, the benefits of the Project are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level have been largely limited through the appropriate placement of infrastructure within the Development Footprint within lower sensitive areas through the avoidance of features and areas considered to be sensitive, the benefits of the Project are expected to partially offset the localised environmental costs of the Buffelspoort Solar PV Energy Facility. From a social perspective, both positive and negative impacts are expected.

Through the assessment of the Development Footprint within the Project Site, it can be concluded that the development of the Project will not result in unacceptable environmental impacts (subject to the implementation of the recommended mitigation measures).

9.10 Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the Development Footprint proposed by the Project Developer, the avoidance of the sensitive environmental features within the Development Footprint, as well as the potential to further minimise the impacts to acceptable levels

through mitigation, it is the reasoned opinion of the EAP that the Project is acceptable within the landscape and can reasonably be authorised subject avoidance the sensitive areas identified through the EIA process and the implementation of recommended mitigation measures. The following Project details should be included within the EA for the Project:

» The Buffelspoort Solar PV Facility with a contracted capacity of up to 40MWp, to be located on Portions 75 and 134 of the Farm Buffelspoort 343 JQ and has an aerial extent of approximately 77ha. The grid connection infrastructure is to be located within an assessment corridor that varies in width from 200m to 300m and is up to 2.5km in length and traverses Portion 75, 88, 89, 101, 119, 120, 121, 122 of Farm Buffelspoort 343 JQ, the Remainder of Portion 101 Farm Kafferskraal 342 JQ, and Portion 148, 236, 303, 374, 376 of Farm Kafferskraal 342 JQ.

The following infrastructure is to be included within an authorisation issued for the project:

» Solar PV arrays comprising PV panels and mounting structures.
» Inverters and transformers.
» Cabling between the arrays.
» Onsite facility substation.
» 88kV single circuit overhead power line for the distribution of the generated power, which will be connected to an existing 88kV Substation just north of the proposed project site.
» Battery Energy Storage System (BESS)[19] – to be initiated at a later stage than the Solar PV Energy Facility.
» Temporary laydown area.
» Operations and Maintenance (O&M) building, which will include a site security office, warehouse, storage area and workshop.
» Main access road (existing – to be upgraded with hard surface) and internal (new) gravel roads.
» Fencing around the site, including an access gate.

The following key conditions would be required to be included within an authorisation issued for the Project:

» All mitigation measures detailed within this EIA Report, as well as the specialist reports contained within **Appendices D to J** are to be implemented.
» The EMPr as contained within **Appendix L, M and N** of this EIA Report should form part of the contract with the Contractors appointed to construct and maintain the Solar PV Energy Facility and associated infrastructure in order to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the Project is considered key in achieving the appropriate environmental management standards as detailed for this Project.
» A 15 m post mitigation buffer was assigned to the wetland systems.
» A 32 m Zone of Regulation in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) should be assigned to the drainage lines; and A 100 m Zone of Regulation in accordance with the National Water Act, 1998 (Act No. 36 of 1998) should be assigned to the drainage lines.
» A Summer/Spring survey during the migratory time frames of birds should ideally be done to ensure the species of conservation concern that could be impacted are considered.

[19] The BESS is included as part of the ESIA process albeit that the facility will only be installed after the Solar PV Energy Facility has come into operation. The total electricity requirements for the offtaker are currently under review and an energy master plan is being developed, which will only be finalised post implementation of the Solar PV Energy Facility to address all the electricity needs of the offtaker. The BESS has been included in this ESIA in order to ensure that should the energy master plan require this component to be included sooner than expected that it has already been authorized.

- Avoid the destruction and development of rocky areas within the Degraded Bushveld Habitat.
- A 30-meter buffer should be implemented from the outer edge of the archaeological site (BFP-01).
- If the preservation of the site is not possible mitigation before destruction will be required. Then a Phase 2 archaeological mitigation process must be implemented. This will include, surface collections, test excavations and analysis of recovered material. A permit issued under s35 of the NHRA will be required to conduct such work. On completion of the mitigation work, the developer can apply for a destruction permit with the backing of the mitigation report.
- Burial grounds and Graves site should be demarcated with a 50-meter buffer as per SAHRA guidelines and avoid them. A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by SAHRA BGG). Stakeholder engagement will need to be implemented in the case where the graves are to be relocated. If this is not possible a detailed grave relocation process must be implemented as required under the NHRA and National Health Act regulations.
- Implement a chance finds procedure for the rescuing of any fossils or heritage resources discovered during construction.
- Obtain the necessary permits for specimens or protected plant species that will be lost due to construction of the project.
- As far as possible, locate infrastructure within areas that have been previously disturbed or in areas with lower sensitivity scores.

A validity period of 10 years of the Environmental Authorisation is requested, should the project obtain approval from North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT).

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