ESKOM HOLDINGS SOC (LTD)

KOMATI POWER STATION SOLAR PHOTOVOLTAIC FACILITY, BATTERY ENERGY STORAGE SYSTEMS AND ASSOCIATED INFRASTRUCTURE, MPUMALANGA PROVINCE

DRAFT ENVIRONMENTAL SCOPING REPORT

31 JANUARY 2023

FOR PUBLIC REVIEW

KOMATI POWER STATION SOLAR PHOTOVOLTAIC FACILITY, BATTERY ENERGY STORAGE SYSTEMS AND ASSOCIATED INFRASTRUCTURE, MPUMALANGA PROVINCE

DRAFT ENVIRONMENTAL SCOPING REPORT

ESKOM HOLDINGS SOC (LTD)

TYPE OF DOCUMENT (VERSION)
FOR PUBLIC REVIEW

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Principal Consultant

This Scoping Report (Report) for the Proposed Construction of a Solar Photovoltaic and Battery Energy Storage System Facilities at the Komati Power Station has been prepared by WSP Group Africa (Pty) Ltd (WSP) on behalf and at the request of Eskom Holdings SOC Ltd (Client), as part of the application process for Environmental Authorisation.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client, as well as the supporting specialist studies. We have not reviewed any other documents in relation to this Report, except where otherwise indicated in the Report.

DOCUMENT DESCRIPTION

APPLICANT

Eskom Holdings SOC Limited

PROJECT NAME

Komati Power Station Solar Photovoltaic Facility, Battery Energy Storage System Facilities and Associated Infrastructure, Mpumalanga Province

PRE-APPLICATION REFERENCE NUMBER

2022-06-0013

DFFE REFERENCE NUMBER

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REPORT TYPE

Draft Environmental Scoping Report

WSP PROJECT NUMBER

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PRODUCTION TEAM

CLIENT

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Chief Advisor: Environmental Management	Justice Ramagoma
Environmental Manager: Generation	Deidre Herbst
Middle Manager: Environmental Management	Felicia Sono
Komati Environmental Manager	Mokgadi Mvambo

WSP

Project Director	Ashlea Strong
Project Manager	Tutayi Chifadza
Senior Consultant	Megan Govender
Air Quality Specialist	Kirsten Collet
Noise Specialist	Kirsten Collet
Soil Specialist	Zakariya Nakhooda
Groundwater Specialist	Sarah Skinner
Social Specialist	Stephen Horak
Surface Water Specialist	Eugeshin Naidoo
Terrestrial Ecology Specialist	Tebogo Khoza

Wetland & Aquatic Specialist	Bradley Graves

SUBCONSULTANTS

Heritage Specialist	Anton Pelser (A Pelser Archaelogical Consulting)
Palaeontology Specialist	Heidi Fourie
Traffic Specialist	Nico Jonker (Innovative Transport Solutions (Pty) Ltd)
Visual Specialist	Lourens du Plessis (LOGIS)

GLOSSARY

ABBREVIATION	MEANING
AC	Alternating current
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BESS	Battery Energy Storage System
BMS	Battery Management System
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CAT	Cable Avoidance Tool
CBA	Critical Biodiversity Area
CSIR	Council for Scientific and Industrial Research
CSM	Conceptual Site Model
CSP	Concentrated Solar Power
CVB	Channelled valley bottom
DC	Direct current
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EJETP	Just Energy Transition Plan

ABBREVIATION	MEANING
EP	Equator Principles
EPS	Engineering, Procurement, and Construction
ERA	Electricity Regulation Act
ESF	Environmental and Social Framework
ESI	Energy Supply Industry
ESIA	Environmental and Social Impact Assessment
Eskom	Eskom Holdings SOC (LTD)
EMP	Environmental Management Programme
ESMS	Environmental and Social Management System
ESRMS	Environmental and Social Risk Management Systems
ESS	Environmental and Social Standards
FI	Financial Institution
GA	General Authorisation
GHG	Greenhouse Gas
GPN	Good Practice Notes
GPR	Ground Penetrating Radar
GQM	Groundwater Quality Management
HIA	Heritage Impact Assessment
HR	Human Resources
I&AP	Interested and Affected Party
IBA	Important Bird Area
IDP	Integrated Development Plan
IEP	Integrated Energy Plan

ABBREVIATION	MEANING
IFC	International Finance Corporation
ILO	International Labour Organization
IPF	Investment Policy Financing
JETP	Just Energy Transition Plan
KBA	Key Biodiversity Area
LSA	Local Study Area
MEGDP	Mpumalanga Economic Growth and Development Path
MIDP	Mpumalanga Industrial Development Plan
MPHRA	Mpumalanga Provincial Heritage Resource Authority
MPRDA	Mineral and Petroleum Resources Development Act (No. 28 of 2002)
NDM	Nkangala District Municipality
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council Act
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMAQA	The National Environmental Management: Air Quality (Act 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act
NEMWA	National Environmental Management: Waste Act (No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NIP	National Infrastructure Plan
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act (No. 36 of 1998)
NWM	National Wetland Map

ABBREVIATION	MEANING
OHS	Occupational Health and Safety
OHSA	National Occupational Health and Safety Act (No. 85 of 1993)
PCD	Pollution Control Dam
PCS	Power Conditioning System
PES	Present Ecological State
PICC	Presidential Infrastructure Coordinating Commission
PS	Performance Standards
PV	Photovoltaics
REDZ	Renewable Energy Development Zone
REIPPP	Renewable Independent Power Producer Programme
RFI	Radio Frequency Interference
RSA	Regional Study Area
SAAQIS	South African Air Quality Information System
SACAA	South African Civil Aviation Authority
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resource Information System
SANAS	South African National Accreditation System
SANS	South African National Standards
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Service
SCC	Species of Conservation Concern
SDF	Spatial Development Framework

ABBREVIATION	MEANING
SDG	Sustainable Development Goals
SEF	Solar Energy Facility
STLM	Steve Tshwete Local Municipality
ToR	Terms of Reference
UN	United Nations
UNDP	United Nations' Development Programmes
WBG	World Bank Group
WEF	Wind Energy Facility
WHO	World Health Organisation
WMA	Water Management Area
WSP	WSP Group Africa (Pty) Ltd
WUL	Water Use Licence
WULA	Water Use Licence Application

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1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Eskom Holdings SOC (Ltd) (Eskom) to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed 100 MW Solar Photovoltaics (PV) Energy Facility (SEF); 150 MW Battery Energy Storage System (BESS); and associated infrastructure at the Komati Power Station located in the Mpumalanga Province, South Africa.

In order for the proposed project to proceed, it will require an Environmental Authorisation (EA) from the Competent Authority (CA) (i.e. the National Department of Forestry, Fisheries and Environment, (DFFE)).

1.1 PURPOSE OF THIS REPORT

This Draft Scoping Report (DSR) documents the process and findings of the scoping phase of the Scoping and Environmental Impact Assessment (S&EIA) process for the proposed Eskom SEF and BESS Facilities, located approximately 37km from Middelburg in the Mpumalanga Province of South Africa.

The DSR aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts to be addressed in the environmental assessment, and the consultation process undertaken through the EIA process.

1.2 BACKGROUND INFORMATION

Eskom is a South African utility that generates, transmits and distributes electricity and supplies approximately 95% of the country's electricity. Eskom's 2035 strategy encompasses the journey that Eskom intends to take in response to the changing energy environment and the impact this has towards a sustainable power utility. This strategy is necessitated by the challenges that Eskom faces as a business as well as the global and local shifts occurring in the energy sector particularly with respect to environmental and climate change challenges, difficulties in accessing financing and changes to the macro industry environment significantly altering the energy supply industry. The road to 2035, includes the shutting down of a number of coal-fired power stations, repurposing and repowering, delivering new clean generation projects, expanding the Transmission grid, and rolling out micro grid solutions.

Several power stations are reaching the end-of-life. These stations will go into extended cold reserve and are most likely to be fully decommissioned in the future. Eskom is considering a shutdown, dismantling and repurposing of some of its fleet as it reaches its end-of-life. Komati Power Station, located near Middelburg in the Mpumalanga Province (Refer to **Figure 1.1**), reached its end-of-life in September 2022. Eskom has developed a Just Energy Transition Project (EJETP) aimed at mitigating the negative social impacts resulting from the shutting down of the plant and to implement projects for the repowering and repurposing related to the Komati Power Station. This is one of several initiatives in which Eskom proposes to establish a solar energy generating facility which will include the installation of a 100 MW SEF as well as 150MW BESS facilities.

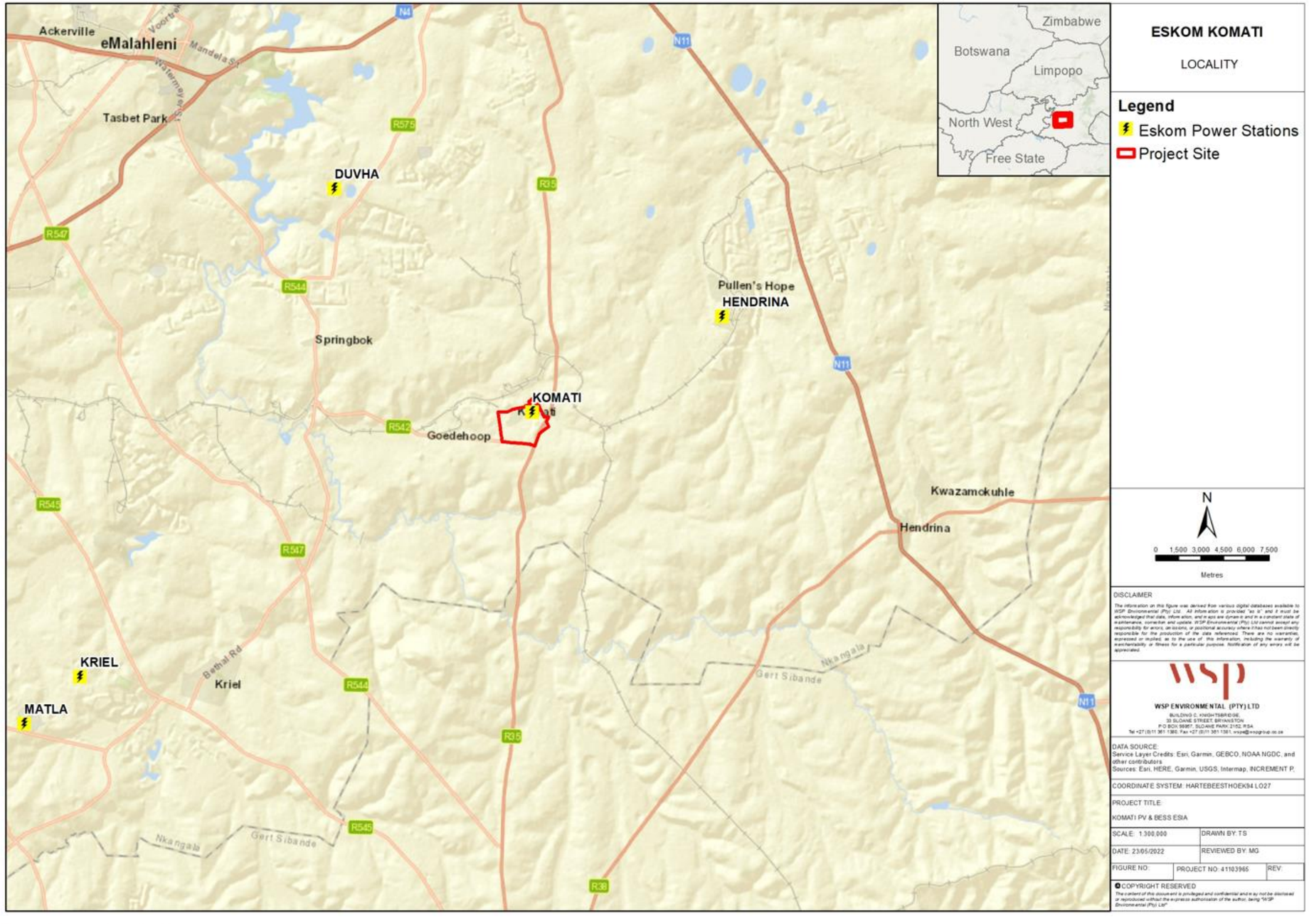


Figure 1.1: Locality Map

1.3 KEY ROLE PLAYERS

1.3.1 PROJECT PROPONENT

Eskom is the project proponent (Applicant) with regards to this project for the construction and operation of the Solar PV, BESS and associated infrastructure. **Table 1.1** provides the relevant details of the project proponent.

Table 1.1: Details of Project Proponent

PROPONENT	**ESKOM HOLDINGS SOC (LTD)**
Contact Person	Deidre Herbst
Postal Address	PO Box 1091, Johannesburg
Telephone	011 800 3501
Email	Deidre.Herbst@eskom.co.za

1.3.2 COMPETENT AUTHORITY

Section 24C(2)(a) of NEMA stipulates that the Minister of Forestry, Fisheries, and the Environment ("the Minister") must be identified as the CA if the activity has implications for international environmental commitments or relations. GN 779 of 01 July 2016 identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related the Integrated Resource Plan (IRP) 2010 – 2030.

The CA (i.e., DFFE) was confirmed during the Pre-Application Meeting held on **06 July 2022**.

Table 1.2 provides the relevant contact details of the competent authority on the Project.

Table 1.2: Competent Authority

ASPECT	**COMPETENT / COMMENTING AUTHORITY**	**CONTACT DETAILS**
Competent Authority: **Environmental Authorisation**	Department of Forestry, Fisheries and the Environment (DFFE)	Case Officer: Trisha Rene Pillay tpillay@dffe.gov.za Integrated Environmental Authorisations

1.3.3 COMMENTING AUTHORITIES

The following commenting authorities have been identified for this application:

- Department of Mineral Resources and Energy;
- DFFE: Biodiversity Conservation Unit;

- DFFE: Protected Areas;
- Mpumalanga Department Agriculture, Rural Development, Land and Environmental Affairs;
- Department of Water and Sanitation (DWS);
- Olifants Water Management Area (WMA) Authority;
- South African Heritage Resource Agency (SAHRA);
- Mpumalanga Heritage Resources Authority (MHRA);
- Mpumalanga Tourism and Parks Agency (MTPA);
- Civil Aviation Authority;
- Air Traffic and Navigation Services (ATNS);
- Department of Defence (SA Army);
- Astronomy Management Authority;
- South African Weather Services (SAWS);
- South African National Roads Agency Limited;
- Nkangala District Municipality; and
- Steve Tshwete Local Municipality.

1.3.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIA processes as per NEMA for the development of the Project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1.3** details the relevant contact details of the EAP. To adequately identify and assess potential environmental impacts, a number of specialists will support the EAP.

Table 1.3 Details of the EAP

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	**WSP GROUP AFRICA (PTY) LTD**
Contact Person	Tutayi Chifadza
Postal Address	PO Box 98867, Sloane Park 2151, Johannesburg
Telephone	011 361 1390
Email	Tutayi.Chifadza@wsp.com
EAPASA Registration Number	2019/1302 (Registered EAP)

STATEMENT OF INDEPENDENCE

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.3.5 SPECIALISTS

Specialist input was required in support of this Scoping Report. The details of the specialists are provided in **Table 1.4** below.

Table 1.4 Details of Specialists

ASSESSMENT	NAME OF SPECIALIST	COMPANY	SECTIONS IN REPORT
Air Quality	Kirsten Collet	WSP	**Section 5.1.5** **Section 6** **Appendix G-1**
Noise	Kirsten Collet	WSP	**Section 5.1.6** **Section 6** **Appendix G-2**
Soils and Land Capability	Zakariya Nakhooda	WSP	**Section 5.1.9** **Section 6** **Appendix G-3**
Surface Water	Eugeshin Naidoo	WSP	**Section 5.1.7** **Section 6** **Appendix G-4**
Terrestrial Biodiversity	Tebogo Khoza	WSP	**Sections , 5.2.1, 5.2.2, 5.2.3** **Section 6** **Appendix G-5**
Groundwater	Sarah Skinner	WSP	**Section 5.1.8** **Section 6** **Appendix G-12**
Heritage	Anton Pelser	A Pelser Archaelogical Consulting	**Section 5.3.3** **Section 6** **Appendix G-6**
Palaeontology	Heidi Fourie	Independent Consultant	**Section 5.3.4** **Section 6** **Appendix G-7**
Social	Stephen Horak	WSP	**Section 5.3.5** **Section 6** **Appendix G-11**

Traffic	Nico Jonker	Innovative Transport Solutions (Pty) Ltd	**Section 5.3.1** **Section 6** **Appendix G-10**
Visual	Lourens du Plessis	LOGIS	**Section 5.3.2** **Section 6** **Appendix G-8**
Aquatic Biodiversity	Bradley Graves	WSP	**Section 5.2.4** **Section 6** **Appendix G-9**

1.4 SCOPING TERMS OF REFERENCE

The 2014 EIA Regulations (GNR 982), as amended, identifies the proposed SEF development as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notices 1 and 2 (GNR 983 and 984, as amended).

As defined in Appendix 2 of GNR 982, as amended, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Public participation is a requirement of scoping; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIA decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;

- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

1.5 DRAFT SCOPING REPORT STRUCTURE

Table 1.5 cross-references the sections within the DSR with the legislated requirements as per Appendix 2 of GNR 982.

Table 1.5: Legislated Report Requirements as detailed in GNR 982

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
(a)	Details of	
	the EAP who compiled the report; and	Section 1.3.4 and **Appendix A**
	the expertise of the EAP, including a Curriculum Vitae	**Appendix A**
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Section 4.1 Table 4.1
	Where available, the physical address and farm name	Section 4.1 Table 4.1
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	Section 4.1 Table 4.2
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	Section 4.4
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/A
(d)	A description of the proposed activity, including-	
	All listed and specified activities triggered;	Section 2.1
	A description of the activities to be undertaken, including associated structures and infrastructure;	Section 4.4
(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;	Section 2
(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 location;	Section 4.7
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
	Details of all the alternatives considered;	Section 4.6
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 3.6
	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;	**Appendix F**
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 5 Section 4.6
	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the 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;	Section 7
	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;	Section 3.5
	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;	Section 6
	the possible mitigation measures that could be applied and level of residual risk;	Section 6
	the outcome of the site selection matrix;	Section 4.6.3
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 4.6
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	
	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 8.3
	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 8.1
	aspects to be assessed by specialists;	Section 8.4 and 8.5
	a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 8.6
	a description of the proposed method of assessing duration and significance;	Section 7.6
	an indication of the stages at which the competent authority will be consulted;	Section 8.8

APPENDIX 2	LEGISLATED REQUIREMENTS AS PER THE NEMA GNR 982	RELEVANT REPORT SECTION
	particulars of the public participation process that be conducted during the environmental impact assessment process; and	Section 8.8
	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 8.2
	identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 8.6
(j)	An undertaking under oath or affirmation by the EAP in relation to-	
	the correctness of the information provided in the report;	**Appendix B**
	the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	**Appendix B**
(l)	Where applicable, any specific information required by the competent authority; and	N/A
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

1.6 ASSUMPTION AND LIMITATIONS

General assumptions and limitations:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation; and
- The comments received in response to the public participation process, will be representative of comments from the broader community.

Soil and Land Potential:

- PV Site A has been significantly disturbed by existing agricultural activities making classification of the soil forms difficult;
- The BESS sites have been significantly disturbed owing to the historic construction of the Komati Power Station facilities;
- Site access was difficult owing to the terrain, a lack of access roads and inclement weather; and
- The site could not be traversed such that an even grid matrix of classification points could be set up. As a result, some extrapolation of findings will be necessary.

Terrestrial Biodiversity:

- The baseline description is qualitative and based on the available desktop information supplemented by preliminary scoping-level data gathered during the site visits;
- The preliminary identification of potential impacts and mitigation measures focus on fauna and flora species of concern with potential to occur in the study area; and
- The selection of species of concern for the scoping level screening of impacts was based on the level of knowledge (that is, ecology and conservation status) of the species to act as surrogates for all species in the area, and adopts the hypothesis that conditions which support vertebrates and/or vascular plant species of concern are likely to also support species of concern from other taxonomic groups.

Heritage:

- A desktop study was undertaken for this phase of the project; and
- A site visit will be undertaken during the EIA phase to confirm that there are no significant sites, features or material of archaeological and/or historical origin or nature present.

Palaeontology:

- The accuracy and reliability of the report may be limited by the following constraints:
  - Most development areas have never been surveyed by a palaeontologist or geophysicist;
  - Variable accuracy of geological maps and associated information;
  - Poor locality information on sheet explanations for geological maps;
  - Lack of published data;
  - Lack of rocky outcrops;
  - Field work; and
  - Insufficient data from developer and exact lay-out plan for all structures.

Groundwater:

- The study is based on available data and has not been verified;
- The available monitoring data is limited to the area surrounding the Komati Power Station. Groundwater monitoring data is therefore limited in the PV and BESS areas with no information for Block B (PV Site B), C, D and F (All BESS sites except the site adjacent to the coal stockyard). This will be resolved following the pending study being carried out as part of the Contaminated Land Scope of work;
- There is no database of water level information available. This data was obtained from the monitoring reports but it is noted that the latest data is hand written and the sample ID's are not verified. For example, there is no monitoring borehole AB08, it is assumed that this point is PB08;
- Borehole logs are limited to 9 of the 26 boreholes. There was no water strike nor yield information supplied at the time of drilling. Depth to weathering has therefore been assumed; and
- There is little distinction between a shallow perched aquifer and deeper fractured rock aquifer in the monitoring data.

2 GOVERNANCE FRAMEWORK

2.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 2.1.**

Table 2.1 Applicable National Legislation[1]

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 983 (as amended) (Listing Notice 1), GNR 984 (as amended) (Listing Notice 2) and GNR 985 (as amended) (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for environmental authorisation (EA) are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a basic assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: An S&EIR process must be followed. An EA is required and will be applied for with the DFFE as the CA.
Listing Notice 1: GNR 983	**Activity 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 275 kilovolts **Description** The Komati Solar PV facility will require 33 kilovolt (kV) Powerline boards (to evacuate power to the grid) and to the BESS facilities. The transmission lines are outside of the urban edge.

[1] It should be noted that all dimensions outlined in relation to Listing Notice 1, 2 and 3 are provisional and are subject to final design.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	Activity 12(ii) The development of - (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse; **Description:** Internal access roads will be required for access to the Facility. The physical footprint of internal access roads and electrical cabling required to connect the various components of the Facilities will either traverse the delineated watercourses on site, or be located within 32m of the outer extent of the delineated watercourses on site. The final footprints specification will be provided in the EIA phase.
	Activity 14 The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. **Description:** The proposed BESS facilities will potentially result in the handling of between 80 and 500 cubic metres of dangerous goods. This activity will only be applicable in the event that the BESS facilities are assembled on site. This is currently unknown. The technical specification will be provided in the EIA Phase.
	Activity 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. **Description:** The proposed infrastructure, with specific reference to access roads and the grid infrastructure, may require the removal of soil more than 10 cubic metres from a watercourse.
	Activity 24 (ii) The development of a road— (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres. **Description:** The proposed access roads for the Solar facility will potentially be 8 metres wide. The technical specification will be provided in the EIA Phase.
Listing Notice 2: GNR 983	**Activity 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, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs — (a) within an urban area. **Description:** Eskom is proposing the establishment of a solar electricity generating facility and ancillary infrastructure as part of its repurposing programme for Komati Power Station. The plan is to install 100MW of Solar PV and 150MW of BESS.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	Activity 15(ii) The clearance of an area of 20 hectares or more of indigenous vegetation. (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres. **Description:** The proposed solar generating facilities will require the clearance of vegetation between 200 and 250 ha. The technical specification will be provided in the EIA Phase.
Listing Notice 3: GNR 985	**Activity 4** The development of a road wider than 4 metres with a reserve less than 13,5 metres. f. Mpumalanga i. Outside urban areas (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. **Description:** The proposed access roads for the Solar facility will potentially be less than 13.5 metres wide within a critical biodiversity area (CBA). The technical specification will be provided in the EIA Phase.
	Activity 10 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. f. Mpumalanga i. Outside urban areas (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. **Description:** The proposed BESS facilities will potentially result in the handling of between 80 and 500 cubic metres of dangerous goods. This activity will only be applicable in the event that the BESS facilities are assembled on site. This is currently unknown. The technical specification will be provided in the EIA Phase.
	Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. f. Mpumalanga ii. Within critical biodiversity areas identified in bioregional plans. **Description:** The total footprint to be cleared is between 200 and 250 ha, the CBA portion is located within Solar Site B. The exact footprint will be determined during the EIA process through the biodiversity impact study. The technical specification will be provided in the EIA Phase.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence as defined in GNR 921. However, the contents of this Scoping Report will include reasonable measures for the prevention of pollution and good international industry practice.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species (AIS) have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) –AIS Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Plan (EMP). A biodiversity assessment will be carried out during the EIA Phase.
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "*no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority*." According to the National Parks Area Expansion Strategy (NPAES), there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.
The National Water Act (No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use Licence (WUL) and Section 22 requires water users to apply for a General Authorisation GA

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	with the DWS if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: (c) Impeding or diverting the flow of water in a watercourse; (i) Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a WUL Application as determined by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the SAHRA, and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: – Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority- – destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite; – destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite. – Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as- – any development or other activity which will change the character of a site— (i) exceeding 5 000m^2 in extent, 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 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 SAHRA Permit Regulations (GN R668). A desktop Heritage Scoping Report (**Appendix D**) has been carried out by a suitably qualified specialist, revealing: – Background research indicates that there are several cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls, but no known ones in the specific study area; – Aerial images show the substantial impacts of past developments on the study area and if any sites, features or material of archaeological and/or historical origin and significance did exist here in the past it would have been substantially disturbed or destroyed as a result; – No Stone Age, Iron Age or recent historical sites, features or material were however identified in the area; and – There is a very low likelihood of any significant sites, features or material of archaeological and/or historical origin or nature being present in the study and proposed development areas.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	The impact of the proposed development on cultural heritage resources will therefore be very low. The proposed project will be loaded onto the SAHRIS portal for comment by SAHRA and the MHRA.
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource.
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by NEMA as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: *(1) The minister may prescribe essential national standards –* *(a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or* *(b) for determining –* *(i) a definition of noise; and* *(ii) the maximum levels of noise.* *(2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.* Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
Conservation of Agricultural Resources Act (No. 43 of 1983)	The CARA provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA AIS Regulations which became law on 1 October 2014.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (Act 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of the Department of Transport. SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices of the International Civil Aviation Organisation, while considering the local context when issuing the South African Civil Aviation Regulations. As of the 1st of May 2021, ATNS has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having medium sensitivity for the proposed project, and no major or other types of civil aviation aerodromes. ATNS and SACAA will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: – Ensure uninterrupted supply of energy to the Republic; – Promote diversity of supply of energy and its sources; – Facilitate effective management of energy demand and its conservation; – Promote energy research; – Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; – Ensure collection of data and information relating to energy supply, transportation and demand; – Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; – Provide for certain safety, health and environment matters that pertain to energy; – Facilitate energy access for improvement of the quality of life of the people of Republic; – Commercialise energy-related technologies; – Ensure effective planning for energy supply, transportation, and consumption; and – Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) aims to: – Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; – Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: – Facilitate investment in the electricity supply industry; – Facilitate universal access to electricity; – Promote the use of diverse energy sources and energy efficiency; – Promote competitiveness and customer and end user choice; and – Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

2.2 POLICIES AND PLANS

Table 2.2 summarised key policies and plans as an outline of the governance framework for the project.

Table 2.2 Applicable Regional Policies and Plans

APPLICABLE POLICY	DESCRIPTION OF POLICY
National Development Plan	The National Development Plan (NDP) aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas (GHG) emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's

APPLICABLE POLICY	DESCRIPTION OF POLICY
	medium- and long-term economic and social objectives. The plan 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. – Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan 2010 – 2030	The Integrated Resource Plan (IRP) is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. 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 GHG emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that solar PV, wind and Concentrated Solar Power (CSP)with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.

APPLICABLE POLICY	DESCRIPTION OF POLICY
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. 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 IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: — 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. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: — The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. — The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy. — The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. — The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the NDP, are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

APPLICABLE POLICY	DESCRIPTION OF POLICY
	By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
National Protected Area Expansion Strategy, 2010	The National Protected Area Expansion Strategy 2010 (NPAES) 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 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, 2010). According to the NPAES, there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.
Just Transition	Eskom has a Just Energy Transition Office which was established in 2020. According to Eskom "Transition" describes the gradual movement towards lower carbon technologies, while "Just" qualifies that this transition will not negatively impact society, jobs and livelihoods. It is therefore important that the planning for the repurposing/repowering of Komati Power Station adhere to the principles of a just transition. South Africa has had a long and critical engagement with just transitions. This includes the early development of labour movement policies in 2011 and the inclusion of just transitions in the National Development Plan (NDP) in 2012. More recently, a commitment to a just transition was incorporated into the 2016 Nationally Determined Contributions that was aligned with the Paris Agreement and followed by a national consultation process on just transitions to inform the revision of NDP in 2019. As of 2020, the Presidential Climate Commission (PCC) drives the clarification and implementation of a just transiiton. To underline the importance of a Just Transition on national level the PCC has been established by the President of the Republic of South Africa to advise on the country's climate change response and pathways to a low-carbon climate-resilient economy and society. The PCC is a multi-stakeholder body with the aim to build social consensus around the complex and challenging decisions required to successfully navigate the climate transition, which includes the phasing out of coal fired power stations. The PCC's mandate emanates from the Presidential Jobs Summit held

APPLICABLE POLICY	DESCRIPTION OF POLICY
	in 2018, and one of the first tasks of the PCC is to understand the impacts of climate change on jobs, both positive and negative. The PCC need to ensure that the transition is socially just and that the needs of vulnerable groups are addressed.

2.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 2.3 Provincial Plans

APPLICABLE PLAN	DESCRIPTION OF PLAN
Mpumalanga Growth and Development Path	The primary objective of the Mpumalanga Economic Growth and Development Path (MEGDP) (2011) is to foster economic growth that creates jobs, reduce poverty and inequality in the Province. The MEGDP identifies supporting the development of clean forms of energy such as wind and hydro power generation opportunities, as well as opportunities including gas production from landfill and organic waste, as one of the key interventions to facilitate growth and job creation in the manufacturing sector. A focal point of the MEGDP is massive investments in infrastructure as a key driver of job creation across the economy, with alternative energy production identified as one of the key opportunities in the Mpumalanga Economic sectors.
Mpumalanga Spatial Development Framework (MSDF), 2019	The Mpumalanga Spatial Development Framework (SDF) (2019) identifies that tourism is an important economic sector and has emerged as a robust driver of growth for emerging economies. The SDF also notes that a significant portion of Mpumalanga's land area is classified as Moderate to High-Very High agricultural potential which can be utilised for agricultural production. However, there are other factors affecting the agricultural sector including loss of agricultural land to other activities, availability of water, contamination of the water used for irrigation by other economic activities, and access to the market. The SDF further notes that mining is the largest economic sector in the province and has assisted other sectors such as manufacturing and power generation, to grow in the province. However, the mining sector has posed some key challenges, including soil and water contamination and environmental pollution, development of mines on good agricultural soil thus threatening food security, restriction of animal movement due to open cast mining thus affecting the ecosystem etc. It also notes that Mpumalanga's manufacturing plants and coal fired power plants are the key polluters of air, with climate change also identified as a key challenge in the province. Therefore, the province must carefully design interventions that provide a gradual shift from mining oriented sectors to the sustainable economic sectors to maintain sustained growth of the provincial economy. The SDF notes that a significant amount of the country's electricity comes from coal-fired stations in Mpumalanga. It also observes that there is a steady increase in the demand for electricity in the province, mostly attributed to residential, commercial and industrial development, including mining and heavy industry. The Provincial SDF also notes that the abundance of coal has led to the development of many coal-fired power stations in the province, however these coalfields are depleting, therefore making it necessary to consider renewable power sources in Mpumalanga. The SDF also recognises that Mpumalanga's Coal Mining and Coal Fired Power Plant region (mainly the Highveld area) will be under immense pressure for environmental considerations and as a result, the region will witness a possible decline in demand of coal and large-scale employment. The SDF proposes to diversify the regional economy and facilitate the gradual transition of economic activities in the region. According to the SDF, power stations using renewable sources (such as wind and solar) can be developed on the unused fallow lands.

APPLICABLE PLAN	DESCRIPTION OF PLAN
Mpumalanga Industrial Development Plan	In terms of industry, the purpose of the Mpumalanga Industrial Development Plan (MIDP) (2015) is to promote the establishment of new industries and promote growth of existing industries in the province. It is however noted that the Msukaligwa Municipality (within which the project falls under) is not directly impacted by the 2025 MIDP and its proposed priority hubs.
Mpumalanga Conservation Act (No. 10 of 1998)	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: – Various species are protected; – 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. According to the Mpumalanga Nature Conservation Act, a permit is required for the removal of any species on this list.
Mpumalanga Biodiversity Sector Plan	The Mpumalanga Biodiversity Sector Plan (MBSP) is a spatial tool with land-use guidelines to inform permissible land-uses that support biodiversity patterns and ecoogical processess. It is used as a land-use descision support tool (to assist with evaluating EIAs). The MBSP has been used for this project and indicates the project location falls within areas categorised Heavily or Moderately Modified Areas, whilst Other Natural Areas occur at some of the proposed development site portions. A CBA occurs at the west, largely covering the portion proposed for the establishment of the solar PV Site B. CBAs are those areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. These are areas of high biodiversity value and should remain in a natural state that is maintained in good ecological condition (Lötter, 2015). The CBA within which the proposed PV Site B is situated is bordered by the Goedehoop Colliery operations on the north and west, and a residential area on the east and farmlands on the south, all of which encompass Heavily or Moderately Modified Areas. Thus the level of anthropogenic disturbance renders the CBA unlikely to meet biodiversity targets for species and ecosystems and ecological processes.

Table 2.4 District and Local Municipality Plans

APPLICABLE PLAN	DESCRIPTION OF PLAN
Nkangala Municipality Integrated Development Plan	According to the Municipal Systems Act (Act 32 of 2000), all municipalities have to undertake an Integrated Development Plan (IDP) process. The IDP is a legislative requirement thus it has legal status and supersedes all other plans that guide development at local government level. The need for a district-based coordination model was announced in the Presidency budget speech in 2019, and the District Development Model was conceived (Nkangala DM IDP 2021/22). The District Development Model DDM is an operational model for improving cooperative governance aimed at building a capable, ethical, and developmental State. It embodies an approach where the three spheres of government and state entities work collaboratively in an impact-oriented way, and where there is higher performance and accountability for coherent service delivery and development out-comes. The district municipality has a Local Economic Development (LED) unit that is tasked with planning and coordinating LED activities in the district as well as collecting and disseminating economic information to the Local Municipalities and other stakeholders with LED interventions. In addition to the LED unit, the municipality has established a Trade and

APPLICABLE PLAN	DESCRIPTION OF PLAN
	Investment office that offer the following services to SMMEs, investors and other economic agents: — Facilitating feasibility studies and business plans — Facilitating access to funding through DFIs and private funders — Assisting with obtaining factory space and/or land — Facilitating joint ventures via the identification of local partners — Providing opportunities for emerging B-BBEE businesses — Providing counselling and training to SMMEs regarding export issues — Advising local business on technical trade issue — Facilitating access to national and local government incentives — Hosting and coordinating business events/exhibitions and delegations to promote Nkangala as a premier trade and investment destination
Steve Steve Tshwete Local Municipality Integrated Development Plan	The Steve Tshwete Local Municipality aims to achieve economic growth and poverty alleviation by coordinating sustainable social and economic development programs. LED projects driven by the municipality are: — The Community Works Programme CWP provides a job safety net for unemployed people of working age where participants engage in community work. — The Expanded Public Works Programme EPWP is a nationwide programme that covers all spheres of government and state-owned enterprises that aims to draw significant numbers of unemployed people into productive work, accompanied by training. — Township economic development — Tourism development — Sector development consisting of a sector analysis (tourism, agri-processing, mining, and manufacturing), investigation of a funding model for economic infrastructure development (roads, social housing) and the development of Centre of Excellence (skills development, incubation, SMME development). — Mining that involved a mining survey that included GIS mapping of all existing mines in the municipal area and social and labour plans. The project aims at promoting accountability among mines and improve communication between the municipality, communities, mines and the DMR. — Investment summit and drive

2.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

2.4.1 WORLD BANK ENVIRONMENTAL AND SOCIAL FRAMEWORK

The Environmental and Social Framework (ESF) became effective on October 1, 2018 and applies to all Investment Policy Financing (IPF) projects initiated after this date. It makes important advances in areas such as labour, non-discrimination, climate change mitigation and adaptation, biodiversity, community health and safety, and stakeholder engagement – including expanding the role of public participation and grievance mechanisms. The ESF enhances the World Bank Group's (WBG's) commitment to sustainable development through ten Environmental and Social Standards (ESS) that are designed to support Borrowers' environmental and social (E&S) risk management. This Project is being considered for funding from the World Bank. A separate Environmental and Social Impact Assessment (ESIA) is being undertaken in line with the ESS to meet the WBG

requirements. A draft ESIA was compiled and disclosed in August 2022 as part of the WB requirements. The ten ESS are outlined in **Table 2.5**.

Table 2.5: Environmental and Social Standards applicable to the project

STANDARD	REFERENCE	APPLICABILITY
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	ESS 1 sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through IPF, in order to achieve environmental and social outcomes consistent with the ESSs. The following objectives are applicable: — To identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs. — To adopt a mitigation hierarchy approach to: a) Anticipate and avoid risks and impacts; b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; c) Once risks and impacts have been minimized or reduced, mitigate; and d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible. — To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. — To utilize national environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate. — To promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity	This document is the draft Scoping Report being undertaken for this project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMP will be compiled during the EIA phase of the project.
ESS 2: Labor and Working Conditions	ESS 2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. The following objective are applicable: — To promote safety and health at work. — To promote the fair treatment, non-discrimination and equal opportunity of project workers. — To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate. — To prevent the use of all forms of forced labour and child labour. — To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.	The construction activities will require contractors for completion. A safe working environment and fair contractual agreements must be in place. The operational phase will have permanent employees for day-to-day activities as well as contractors who will all need a safe working environment and fair contractual agreements. Whilst ESS 2 will be applicable to the Project, it is not intended to be addressed in detail at the EIA stage. Recommendations are provided concerning development of a detailed HR and OHS system by the developer and its partners as the Project moves towards implementation. The EMP will incorporate the requirements for compliance with local and international Labour and Working

STANDARD	REFERENCE	APPLICABILITY
	— To provide project workers with accessible means to raise workplace concerns.	legislation and good practice on the part of the contractors.
ESS 3: Resource Efficiency and Pollution Prevention and Management	ESS 3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life-cycle. The following objectives are applicable: — To promote the sustainable use of resources, including energy, water and raw materials. — To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. — To avoid or minimize project-related emissions of short and long-lived climate pollutants. — To avoid or minimize generation of hazardous and non-hazardous waste. — To minimize and manage the risks and impacts associated with pesticide use.	ESS 3 related impacts, such as the management of construction waste, hazardous substances, and stormwater are assessed in Section 6 of this report. There are no material resource efficiency issues associated with the Project. The EMP will include general resource efficiency measures. The project is not GHG emissions intensive and a climate resilience study or a GHG emissions-related assessment is not deemed necessary for a project of this nature. However, the proped project seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution in the construction phase will be addressed in the EMP. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures will be included in the EMP. The waste generation profile of the project is not complex. Waste mitigation and management measures will be included in EMP. Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel etc.) are the only wastes expected to be associated with the project. The EMP will take these anticipated hazardous materials into account and recommend relevant mitigation and management measures.
ESS 4: Community Health and Safety	ESS 4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable. The following objective are applicable: — To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances. — To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams.	The requirements included in ESS 4 will be addressed in the EIA process and the development of the EMP. During the construction phase there will be an increase in vehicular traffic along public roads, largely due to the need for importation of construction material. Pedestrian and road safety risks will be qualitatively evaluated in the EIA process and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, will be detailed in the EMP.

STANDARD	REFERENCE	APPLICABILITY
	— To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. — To have in place effective measures to address emergency events. — To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	The main objectives of ESS 5 are to: — To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives. — To avoid forced eviction. — To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement cost and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. — To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure. — To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant. — To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.	ESS 5 is not applicable to the proposed project as no physical or economic displacement or livelihood restoration will be required. The proposed project is located on Eskom owned land.
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS 6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development and it recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. ESS 6 also addresses sustainable management of primary production and harvesting of living natural resources, and recognizes the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project. The following objectives are applicable: — To protect and conserve biodiversity and habitats. — To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity.	The Project Area falls within CBAs. A Biodiversity Impact Assessment and Freshwater Ecology Impact Assessment have been included in the proposed scope. The methodologies for the specialist assessments include a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the ESS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa.

STANDARD	REFERENCE	APPLICABILITY
	— To promote the sustainable management of living natural resources. — To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.	The prevalence of invasive alien species will be determined, and mitigation and management measures will be included in the EMP.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;	ESS 7 ensures that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities. ESS 7 is also meant to avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts. The following objective are applicable: — To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities. — To avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts. — To promote sustainable development benefits and opportunities for Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities in a manner that is accessible, culturally appropriate and inclusive. — To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities affected by a project throughout the project's life cycle. — To obtain the Free, Prior, and Informed Consent (FPIC) of affected Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities in the three circumstances described in this ESS. — To recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, and to provide them with an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them.	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area. The Project does not involve displacement. ESS 7 will not be triggered.
ESS 8: Cultural Heritage;	ESS 8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. ESS 8 sets out measures designed to protect cultural heritage throughout the project life cycle. The following objective are applicable:	A desktop Heritage Scoping Report has been compiled by a suitably qualified specialist.

STANDARD	REFERENCE	APPLICABILITY
	— To protect cultural heritage from the adverse impacts of project activities and support its preservation. — To address cultural heritage as an integral aspect of sustainable development. — To promote meaningful consultation with stakeholders regarding cultural heritage. — To promote the equitable sharing of benefits from the use of cultural heritage.	A Chance Find Procedure will be included in the EMP during the EIA phase of the project.
ESS 9: Financial Intermediaries	ESS9 recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. The Bank is committed to supporting sustainable financial sector development and enhancing the role of domestic capital and financial markets. The following objectives are applicable: — To set out how the Financial Intermediaries (FI) will assess and manage environmental and social risks and impacts associated with the subprojects it finances. — To promote good environmental and social management practices in the subprojects the FI finances. — To promote good environmental and sound human resources management within the FI.	ESS 9 is not applicable to this project.
ESS 10: Stakeholder Engagement and Information Disclosure	ESS 10 recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. The following objectives are applicable: — To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties. — To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance. — To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them. — To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format. — To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.	The S&EIR process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication.

2.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the WBG has published Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the World Bank Environmental and Social Standards, particularly in those aspects related to the occupational health and safety aspects contained in ESS 2 – Labour and working conditions, ESS 3 Resource Efficiency and Pollution Prevention and Management, as well as ESS4: Community Health and Safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

The following WBG EHS Guidelines have been generally consulted during the preparation of the EIA in order to aid the identification of EHS aspects applicable to the project:

- *Electric Power Transmission and Distribution (2007)* - information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas
- *General EHS Guidelines* – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted form the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the EIA report.

3 SCOPING METHODOLOGY

The scoping process was initiated in accordance with Appendix 2 of GNR 982, as amended, pertaining to applications subject to an S&EIR process.

3.1 S&EIR PROCESS AND PHASING

The S&EIR process consists of various phases with associated timelines as defined in GNR 982. The process can generally be divided into four main phases, namely, (i) a Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase. The S&EIR process is shown in **Figure 3.1**.

The main objectives of the phases can be described as follows:

- Pre-Application Phase:
  - Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan;
  - Identify stakeholders, including neighbouring landowners/residents and relevant authorities;
- Application and Scoping Phase:
  - Compile and submit application forms to the CA and pay the relevant application fees;
  - Compile a DSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
  - Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase; and
  - Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project.
  - Incorporate comments received from stakeholders during the DSR comment period;
  - Should significant amendments be required, release the updated DSR for a 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
  - Submit the Final Scoping Report (FSR), following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection.
- Impact Assessment Phase:
  - Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
  - Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR;
  - Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
  - Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
  - Submit the EIAR and the associated EMPr to the CA to undertake the decision making process;
  - Authorisation and Appeal Phase;
  - The DFEE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
  - Notify all registered stakeholders of the decision and right to appeal.

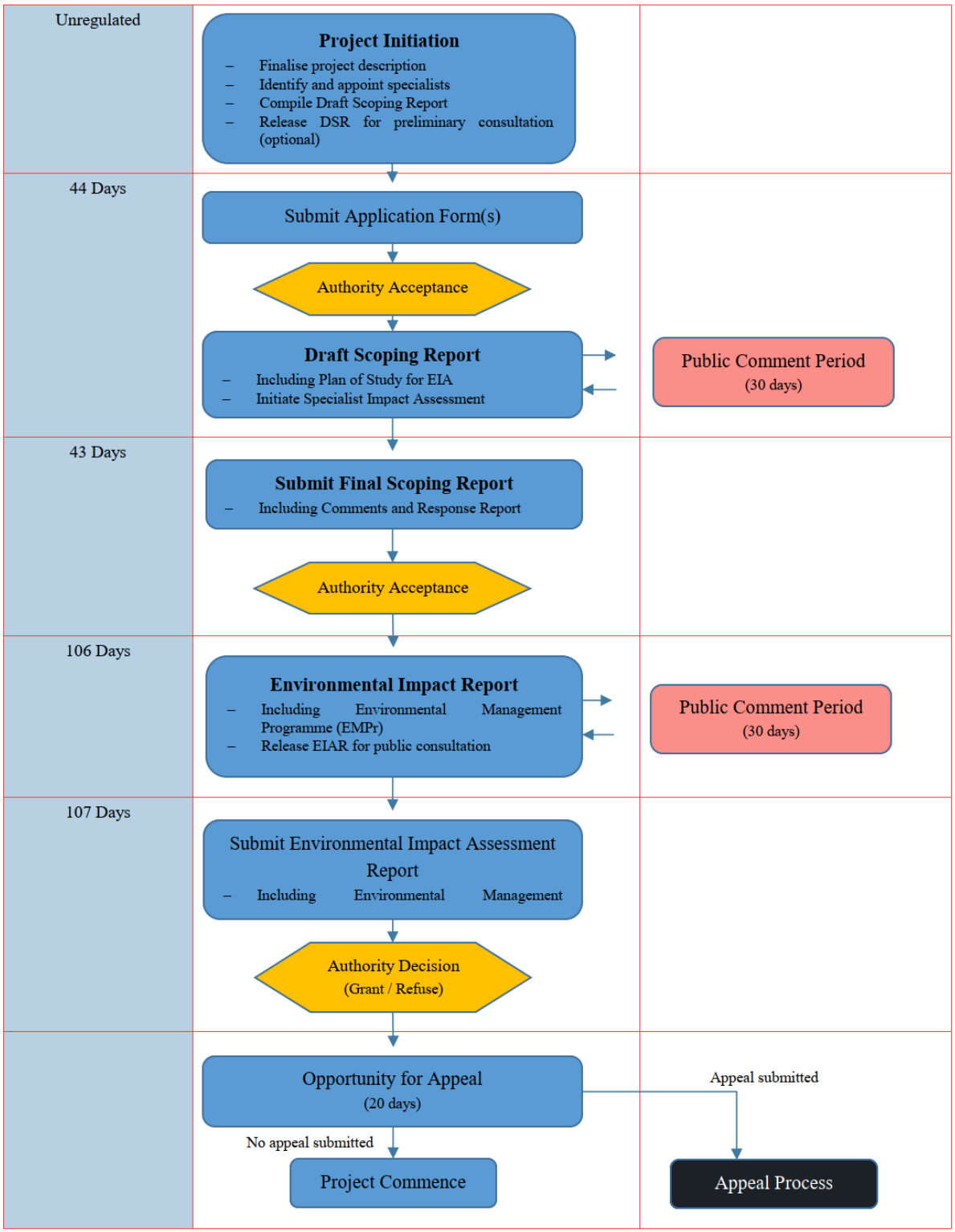


Figure 3.1: S&EIR Process

3.2 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

A National Web-based Environmental Screening Tool has been developed by the DFFE in order to flag areas of potential environmental sensitivity related to a site. The screening tool produces a report as required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). The *Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended* (GN 960 of July 2019) states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed Eskom Solar PV and BESS Project was generated from the website on 23 May 2022 and is attached as **Appendix D**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the S&EIA based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 3.1 below provides a summary of the sensitivities identified for the development footprint.

Table 3.1 Sensitivies identified in the DFFE screening report

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVIY
Agricultural Theme		✓		
Animal Species Theme		✓		
Aquatic Biodiversity Theme	✓			
Archaeological and Cultural Heritage Theme				✓
Avian Theme				✓
Civil Aviation (Solar PV) Theme			✓	
Defence Theme				✓
Landscape (Solar) Theme	✓			
Palaeontology Theme	✓			
Plant Species Theme			✓	

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVIY
RFI Theme			✓	
Terrestrial Biodiversity Theme	✓			

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the EIA report as determined by the screening tool (please refer to **Section 3.2.1** below for the EAP motivation applicable to this list):

- Agricultural Impact Assessment;
- Landscape/Visual Impact Assessment;
- Archaeological and Cultural Heritage Impact Assessment;
- Palaeontology Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Civil Aviation Impact Assessment;
- Defence Assessment;
- Radio Frequency Interference (RFI) Assessment;
- A Geotechnical Assessment;
- Socio-Economic Assessment;
- Plant Species Assessment; and
- Animal Species Assessment.

3.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that "it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation."

As summarised in **Table 3.1** above, the following specialist assessments have been commissioned for the project based on the environmental sensitivities identified by the Screening Report:

- Agricultural Impact Assessment;
- Landscape/Visual Impact Assessment;
- Archaeological and Cultural Heritage Impact Assessment;
- Palaeontology Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Socio-Economic Assessment;
- Plant Species Assessment; and
- Animal Species Assessment.

Four of the identified specialist studies will not be undertaken as part of the S&EIR process for the proposed project. Motivation for the exclusion of these specialist studies is provided below:

- **Detailed Geotechnical**

  A detailed Geotechnical Assessment will not be undertaken as part of the S&EIR Process as this will be undertaken during the detailed design phase. A desktop geotechnical study has been undertaken and is included in **Appendix G-13**.

- **RFI Assessment**

  A RFI Study will not be undertaken. The proposed development area is not located within any Astronomy Advantage Area. The SAWS and relevant telecommunications stakeholders will be engaged with as part of the Public Participation Process.

- **Civil Aviation**

  According to the DFFE Screening Tool Report, civil aviation is regarded as having medium sensitivity. No major or other types of civil aviation aerodromes. A formal Civil Aviation Assessment will not be undertaken as part of the S&EIR Process. Nevertheless, the relevant Authorities will be included on the project stakeholder database. As of the 1st of May 2021, ATNS has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. An Application for the Approval of Obstacles will also be submitted to ATNS. The SACAA will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.

- **Defence**

  The Department of Defence will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from this authority as applicable.

3.3 APPLICATION

The application phase consists of the completion of the appropriate application form by the EAP and the Proponent as well as the subsequent submission and registration of the application for EA with DFFE.

A request for a pre-application meeting was submitted to DFFE on 08 June 2022. DFFE responded with the allocation of an assessing officer and reference number (2022-06-0013). A virtual pre-application meeting was held on **06 July 2022** with the DFFE to discuss the proposed Eskom SEF and BESS Project. The minutes of the meeting and the public participation plan were approved on **02 August 2022** respectively and are included in **Appendix E**.

3.4 BASELINE ENVIRONMENTAL AND SOCIAL ASSESSMENT

The property where the developments will occur is owned by Eskom. The specialist studies from this process and further research have been utilised to support the proposed developments statutory application process. Therefore, the description of the baseline environment has been compiled through a combination of site investigations, desktop reviews and information obtained from the existing and new specialist assessments. Desktop reviews made use of available information including existing reports, aerial imagery and mapping.

An understanding of the receiving environment is critical in order to identify aspects that may be affect by the project and in turn how the surrounding physical, biological and social environment may affect project design considerations.

3.5 IDENTIFICATION AND EVALUATION OF POTENTIALLY SIGNIFICANT IMPACTS

The potential impacts associated with the proposed development were determined at both a desktop level based on existing information, as well as the field assessment. The following methodology was used:

- Identify potential sensitive environments and receptors that may be impacted on by the proposed development;
- Identify potential social receptors that may be impacted on by the proposed development;
- Identify the type of impacts that are most likely to occur (including cumulative impacts);

- Determine the nature and extent of the potential impacts during the various developmental phases, including, construction, operation and decommissioning;
- Identify potential No-Go areas (if applicable); and
- Summarise the potential impacts that will be considered further in the Scoping & EIA phase through detailed specialist studies.

Appendix 2 of GNR 982, as amended, requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and consequence (**Table 3.2),** where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in **Table 3.3** and **Table 3.4** respectively.

Table 3.2 Significance Screening Tool

		CONSEQUENCE SCALE			
PROBABILITY SCALE		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 3.3 Probability Scores and Descriptors

SCORE	DESCRIPTOR
4	**Definite:** The impact will occur regardless of any prevention measures
3	**Highly Probable:** It is most likely that the impact will occur
2	**Probable:** There is a good possibility that the impact will occur
1	**Improbable:** The possibility of the impact occurring is very low

Table 3.4 Consequence Score Descriptions

SCORE	NEGATIVE	POSITIVE
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe: A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (**Table 3.5**) has been applied according to the nature and significance of the identified impacts.

Table 3.5 Impact Significance Colour Reference System to Indicate the Nature of the Impact

NEGATIVE IMPACTS (-VE)	POSITIVE IMPACTS (+VE)
Negligible	Negligible
Very Low	Very Low
Low	Low
Medium	Medium
High	High

3.6 STAKEHOLDER ENGAGEMENT

Stakeholder engagement (public participation) is a requirement of the S&EIA process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIA decision-making process. Effective

engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

A Stakeholder Engagement Report (SER) has been compiled and included in the DSR (**Appendix F)** detailing the projects' compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

3.6.1 PUBLIC PARTICIPATION PLAN

As part of the pre-application consultation meeting held with DFFE on **06 July 2022**, the proposed plan for public participation was discussed. A public participation plan was subsequently submitted to DFFE, along with the meeting minutes, for approval. The public participation plan was approved by DFFE on **02 August 2022**. The approved public participation plan is included in **Appendix E**.

3.6.2 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;
- Placement of community notices;
- Completed comment sheets; and
- Attendance registers at meetings.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in Appendix A of the SER (**Appendix F**).

3.6.3 STAKEHOLDER NOTIFICATION

DIRECT NOTIFICATION

Notification of the proposed Project was issued to potential Stakeholders, via direct correspondence (i.e., site notices) on **09 June 2022**. Proof of notification is included in the SER (i.e. **Appendix F** of this DSR).

NEWSPAPER ADVERTISEMENTS

In accordance with the requirements of GNR 982, as amended, the proposed project was advertised in two local newspapers. The purpose of the advertisement was to notify the public about the proposed project and to invite them to register as stakeholders. A copy of the advertisements are included in Appendix B-1 of the SER (**Appendix F)**. The relevant scoping phase advertisement dates are listed in **Table 3.6**.

Table 3.6: Dates on which the Adverts were published

NEWSPAPER	PUBLICATION DATE	LANGUAGE
Witbank News	10 June 2022	English and IsiZulu
Highvelder	10 June 2022	English and Afrikaans

SITE NOTICES

The official site notices were erected as per GNR 982, as amended, on the boundary fence of the proposed site. In addition, general project notices, announcing the Proposed Project and inviting stakeholders to register, were placed at various locations in and around the project area. A copy of the site notice is included in Appendix B-2 of the SER (**Appendix F**).

3.6.4 PUBLIC REVIEW

The DSR will be placed on public review for a period of 30 days from **03 February 2023** to **06 March 2023**, at the following public places:

- Komati Power Station Entrance
- Komati Paypoint and Library;
- Gerard Sekoto Library;
- Eastdene Public Library;
- Hendrina Public Library; and
- WSP website (https://www.wsp.com/en-ZA/services/public-documents).

3.6.5 COMMENT AND RESPONSE REPORT

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') received to date have been documented and responded to adequately in the Comment and Response Report (CRR) included in Section 2.3 of the SER included in **Appendix F**. Where comments are project specific, this will be noted in the CRR. The CRR records the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

3.6.6 WAY FORWARD

FINAL SCOPING REPORT SUBMISSION

All issues raised during the scoping phase of the proposed project will be incorporated into the FSR and will be addressed during the EIA Phase.

The DFFE will be allocated 43 days to review the FSR. The FSR will be placed on stakeholder review for a reasonable time period during the DFFE's final review and decision-making process. The delegated CA must within this specified timeframe issue a decision on whether to proceed onto the next phase, the EIA phase

ONGOING CONSULTATION AND ENGAGEMENT

In addition to the public documents distributed to stakeholders, there will be ongoing communication between the proponent, the WSP and stakeholders throughout the S&EIR process. These interactions include the following:

- In addition to the project announcement letters, a letter will be sent out to all registered stakeholders providing them with an update of the proposed project once the FSR has been approved;
- Interactions with stakeholders will take place in English, Afrikaans and Zulu;
- Feedback to stakeholders, individually and collectively;
- Written responses (email, faxes or letters) will be provided to stakeholders acknowledging issues and providing information requested (dependent on availability); and
- As per the GNR 982, as amended, particular attention will be paid to landowners, and neighbouring communities, specifically where literacy levels and language barriers may be an issue.

4 PROJECT DESCRIPTION

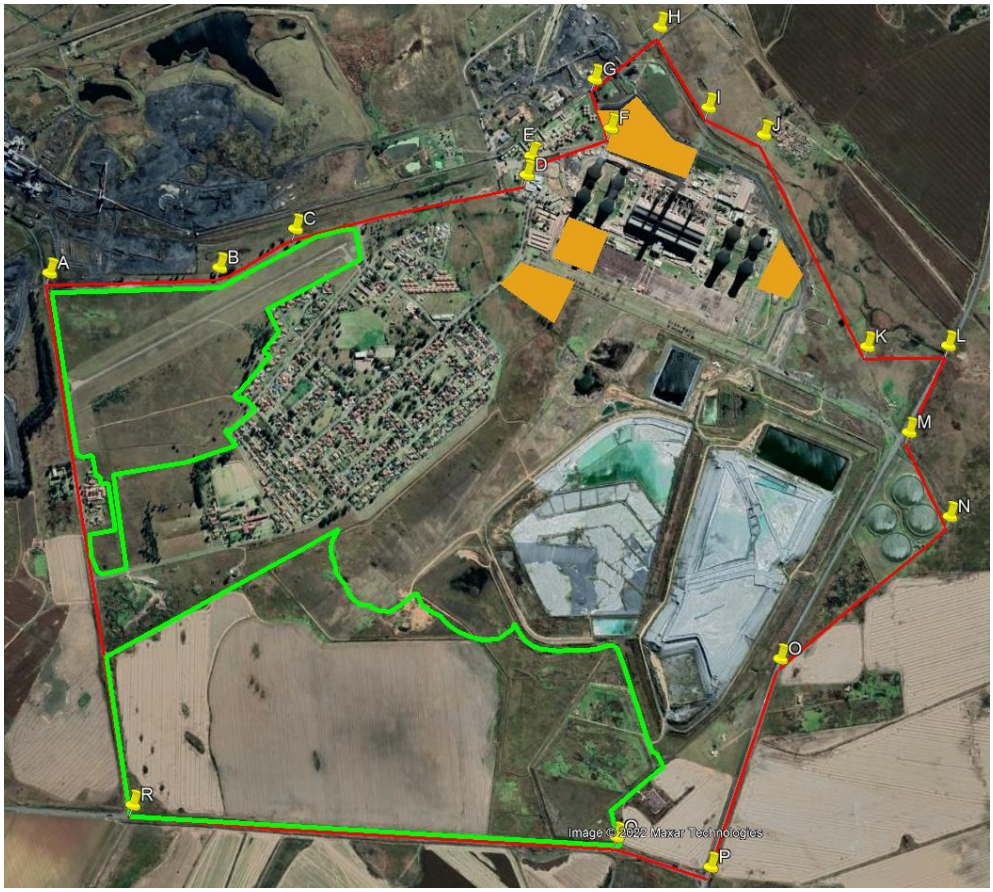
4.1 SITE LOCATION

The Komati Power Station is situated about 37km from Middelburg, 43km from Bethal and 40km from Witbank in Ward 4, Portion 0 of Farm Komati Power Station 56-IS in the Steve Tshwete Local Municipality located within the Nkangala District Municipality in the Mpumalanga Province. The SEF, BESS facilities and associated infrastructure will be located on Eskom owned land. The locality of the facilities is illustrated in **Figure 1.1**. The layout of the project is illustrated in **Figure 4.3**.

Table 4.1: Eskom Komati SEF Affected Farm Portion

PROPERTY NAME	21 DIGIT SG CODE OF EACH CADASTRAL LAND PARCEL
Portion 0 of Farm Komati Power Station 56-IS	T0IS00000000005600000

Table 4.2: Co-ordinate Points of the Cadastral Land Parcel

POINT	LATITUDE	LONGITUDE
		
A	26° 5'32.63"S	29°26'56.39"E

B	26° 5'31.98"S	29°27'19.25"E
C	26° 5'27.31"S	29°27'29.45"E
D	26° 5'20.81"S	29°28'0.56"E
E	26° 5'18.53"S	29°28'1.16"E
F	26° 5'15.18"S	29°28'11.86"E
G	26° 5'9.26"S	29°28'9.70"E
H	26° 5'2.93"S	29°28'18.46"E
I	26° 5'12.68"S	29°28'24.99"E
J	26° 5'15.96"S	29°28'32.44"E
K	26° 5'41.52"S	29°28'46.33"E
L	26° 5'41.41"S	29°28'57.23"E
M	26° 5'51.86"S	29°28'51.96"E
N	26° 6'2.02"S	29°28'57.44"E
O	26° 6'19.20"S	29°28'34.65"E
P	26° 6'44.32"S	29°28'25.28"E
Q	26° 6'40.71"S	29°28'12.64"E
R	26° 6'36.83"S	29°27'7.56"E

4.2 SOLAR PV GENERATION PROCESS

South Africa experiences some of the highest levels of solar radiation in the world between 4.5 and 6.5kWh/m^2/day) and therefore, possesses considerable solar resource potential for solar power generation.

In terms of large-scale grid connected applications the most commonly used technologies include PV and Concentrated Solar Power (CSP); these are described in some detail in the following sections.

It must be noted that this project is specific to solar power generation through the use of solar PV technology only.

4.2.1 PHOTOVOLTAIC (PV) SYSTEMS

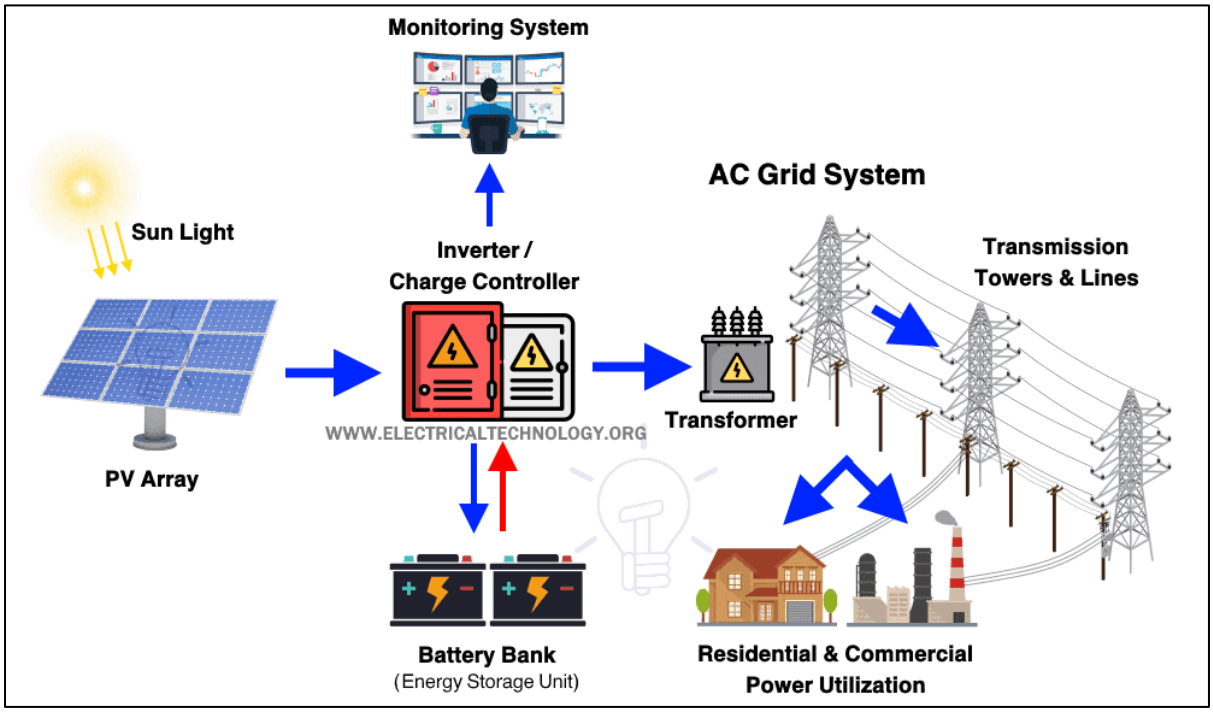
Internationally, solar PV is the fastest-growing power generation technology. Approximately 139 GW was added to the installed capacity globally in 2020, increasing the installed capacity by 18% from the previous year. The total capacity from PVs was 760 GW globally, producing approximately 3% of the world's electricity[2]. In South Africa the solar PV installed capacity in 2020 grew by 37% compared to the previous year's value. As much as 3.6 GW of PV is planned to be installed by 2026, with approximately 1.48 GW already installed as recorded in 2019. Utility-scale CSP plants were in operation long before solar PVs became widely commercialised, however PV has taken over the market, attributed to the declining costs of solar PV modules and associated system. In South Africa, this is also coupled with the supportive government policies. Global CSP capacity grew only 1.6 percent in 2020 to 6.2 GW.

Large-scale or utility-scale PV systems are designed for the supply of commercial power into the electricity grid. Large-scale PV plants differ from the smaller units and other decentralised solar power applications because they supply power at the utility level, rather than to local users.

PV cells are made from semi-conductor materials that are able to release electrons when exposed to solar radiation. This is called the photo-electric effect. Several PV cells are grouped together through conductors to make up one module and modules can be connected together to produce power in large quantities. In PV technology, the power conversion source is via PV modules that convert light directly to electricity. This differs from the other large-scale solar generation technology such as CSP, which uses heat to drive a variety of conventional generator systems.

Solar panels produce direct current (DC) electricity; therefore, PV systems require conversion equipment to convert this power to alternating current (AC), that can be fed into the electricity grid. This conversion is done by inverters. **Figure 4.1** provides an illustration of the main components of a solar PV power plant.

There are two primary alternatives for inverters in large scale systems; being centralised and string inverters.



Source: www.electricaltechnology.org/2021/07/solar-power-plant.html

[2] https://www.c2es.org/content/renewable-energy/

Figure 4.1: Illustration of the main components of a solar power plant

4.3 BESS TECHNOLOGY

BESS consist of two main parts: battery modules and the accompanying Battery Management System (BMS), and a Power Conditioning System (PCS) used to enable the interface of the batteries to the grid. Individual battery cells are connected in a series/parallel arrangement in order to obtain the desired nominal voltage for highest efficiency and required storage capacity. The PCS is a bidirectional power conversion device (inverter), enabling AC power from the grid to be converted to DC to charge the batteries in a controlled manner, and discharge DC battery power to feed AC power onto the grid (**Figure 4.2).**

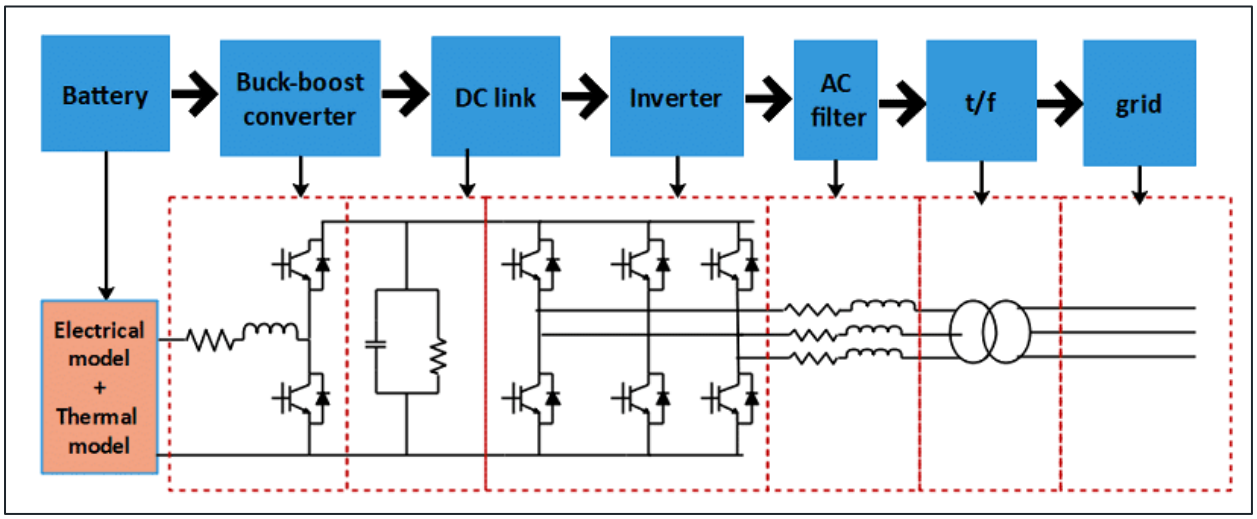


Figure 4.2: BESS components Schematic (Source: www.researchgate.net)

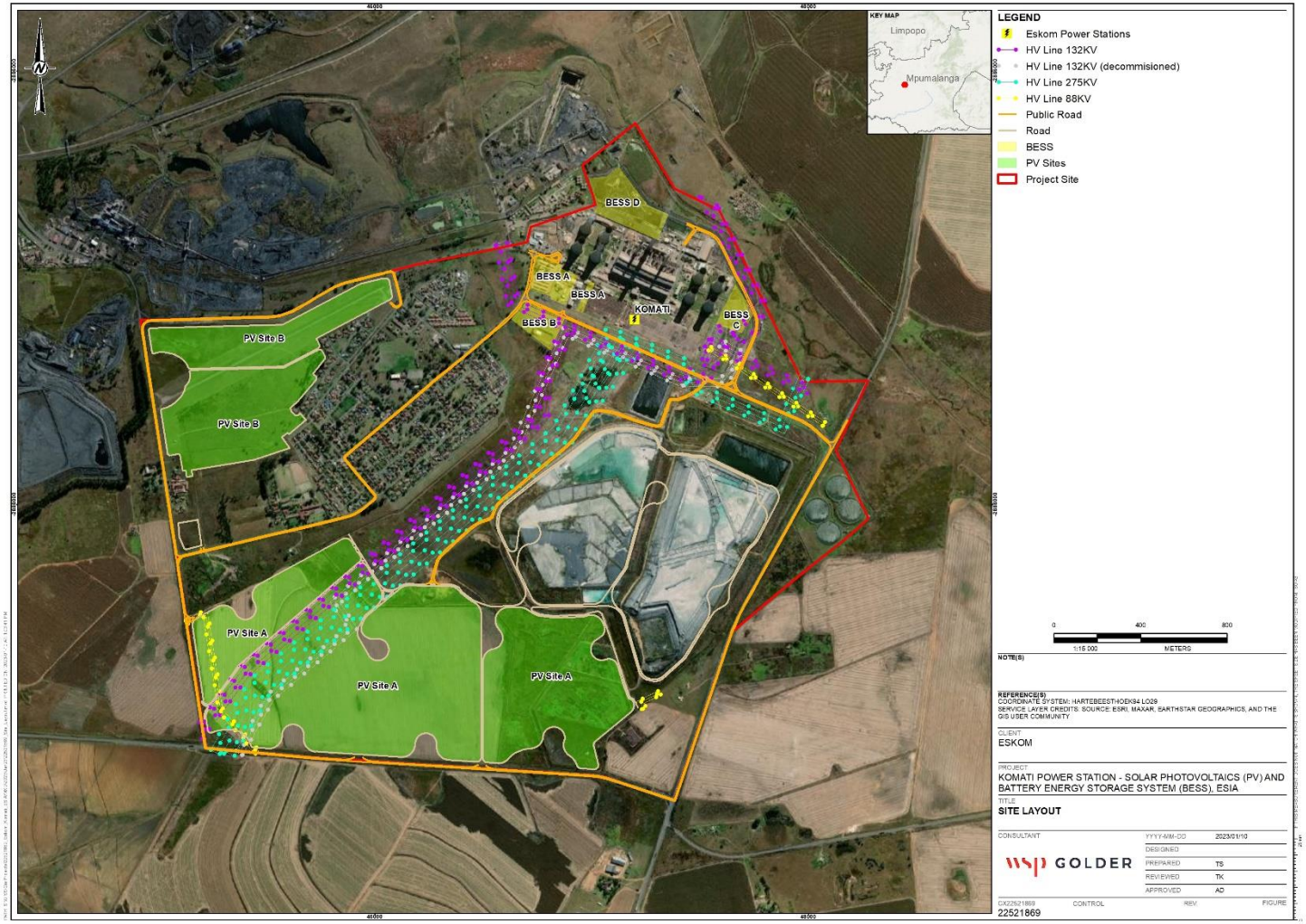


Figure 4.3: Site layout

4.4 PROJECT INFRASTRUCTURE

The proposed project will comprise the following key components:

- Solar Energy Facility;
- Grid Connection (i.e. powerlines);
- Site Substation and BESS; and
- Associated infrastructure.

These items are discussed in more detail below. The SEF is intended to evacuate power to the grid. Part of the design development will be to determine the best option to charge the BESS, either with grid power or power generated from PV.

The current state of this report is based on conceptual design and detailed designs will be made available at a later stage that will be close to the concept design.

4.4.1 SOLAR ENERGY FACILITY

The total site area for PV installation is approximately 200-250 hectares to allow for the construction of a PV facility with capacity up to 100 MW. Solar PV modules which convert solar radiation directly into electricity, will occupy a space of up to a total of approximately 720,000 m^2. The solar PV modules will be elevated above the ground, and will be mounted on either fixed tilt systems or tracking systems (comprised of galvanised steel and aluminium). The Solar PV modules will be placed in rows in such a way that there is allowance for a perimeter road and security fencing along the boundaries, and O&M access roads in between the PV module rows. **Table 4.3** provides a high-level project summary of the proposed Facilities. **Table 4.4** shows the approximate middle point coordinates of the Solar Facilities.

Table 4.3 High-level Project Summary – Renewable Energy Facilities

	SOLAR PV SITE A	SOLAR PV SITE B
Extent	156 Ha	54 Ha
Buildable Area	127 Ha	50 Ha
Capacity	71.5 MW	28.5 MW

Table 4.4: Solar Facilities Approximate Central Coordinates

POINT	LATITUDE	LONGITUDE
PV Site A	26° 6'30.28"S	29°27'37.79"E
PV Site B	26° 5'44.86"S	29°27'13.29"E

4.4.2 GRID CONNECTION

The Solar Facilities will be allocated a point of connection to the Komati High Voltage (HV) yard. Each of the Solar Sites will be equipped with collector substations that will the route the power output to the point of connection via a medium voltage overhead line (OHL) or underground cabling. The method and final route to the points of connection will form part of the final designs. The existing Komati points of connections will be used

with the existing infrastructure to connect to the Komati 275kV HV yard. The existing power evacuation infrastructure consist of step up transformers (140 megavolt Amperes (MVA)), surge arrestors, transmission lines, HV breakers and links to the 275kV busbar.

SERVITUDE

The registered servitude will likely between 36 and 40m. The length of the transmission will be determined during the design stage. The servitude area will be approximately 26ha. The servitude is required to ensure safe construction, maintenance and operation of the powerline.

SUBSTATIONS

On site substations will be established within the extent of the Solar Site A and Solar Site B. The site itself is very homogenous and there are no significant features in the immediate vicinity of the substation location that might be affected by the development. The following infrastructure is proposed but will be confirmed during the design stage:

- O&M buildings housing the control and communication equipment;
- All the access road infrastructure within the substation sites; and
- Site substations and collector substations to consolidate and distribute power to the connection points.

SITE ACCESS

The project area and surrounding areas are already easily accessible due to existing access roads. New access roads or tracks may be required to provide access to sections of the powerline route. Access roads will be mostly a two-track gravel road under the OHPL in order to access pylons for construction and maintenance purposes. The width of the access roads will be determined during the design phase.

4.4.3 BESS

Eskom proposes to establish up to four BESS facilities with the existing footprint of the Komati Power Station.

The BESS footprints will range from 2 ha up to 6 ha, depending on design and optimisation of the site and technology selected. The BESS capacity is envisaged to be 150 MW with four hours standby time.

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology however the specific technology will only be determined following Engineering, Procurement, and Construction (EPC) procurement. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers. The BESS components will arrive on site pre-assembled. **Table 4.5** shows the approximate middle point coordinates of the BESS facilities.

The specifics of the technology to be used (i.e. brand and country of origin) will be provided in the EIA.

Table 4.5: BESS Facilities Approximate Central Coordinates

POINT	LATITUDE	LONGITUDE
BESS Site A	26° 5'14.82"S	29°28'15.73"E
BESS Site B	26° 5'31.37"S	29°28'35.66"E
BESS Site C	26° 5'28.27"S	29°28'7.83"E
BESS Site D	26° 5'33.27"S	29°28'2.26"E

4.4.4 ANCILLARY INFRASTRUCTURE

The additional ancillary infrastructure will be confirmed once the Conceptual Design is complete, however, it is anticipated that the following will be applicable:

- Access roads;
- Perimeter roads;
- Below ground electrical cables;
- Above ground overhead lines;
- Meteorological Station;
- Operations and Maintenance (O&M) Building including control room, server room, security equipment room, offices, boardroom, kitchen, and ablution facilities);
- Spares Warehouse and Workshop;
- Hazardous Chemical Store;
- Security Building;
- Parking areas and roads;
- Temporary laydown areas;
- Temporary concrete batching plant
- Construction camps and temporary laydown areas; and
- Onsite substations.

4.5 PROJECT ACTIVITIES

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 4.6.**

Table 4.6 Construction Activities

ACTIVITY	DESCRIPTION
Establishment access and internal roads	Internal gravel roads will be developed. The roads will be approximately 8m wide and may require widening to ensure that it is suitable for use.
Site preparation and establishment	Site establishment will include clearing of vegetation and any bulk earthworks that may be required. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant etc). The site laydown areas are expected to occur within the footprint of Site A and Site B. Site establishment will also entail the installation and/or connection of services (sanitation, electricity etc).
Transport of components and equipment to site	All construction material (i.e. PV support structure materials), machinery and equipment (i.e. graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Large components (such as substation transformers) may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.
Establishment of a laydown area on site	Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. A laydown area of approximately 2ha has been proposed for this project. The laydown area will also be utilised for the assembly of the PV panels. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
Erection of PV Panels	The PV panels will be arranged in arrays. The frames will be fixed onto vertical posts that will be driven into ground utilising the relevant foundation method identified during the geotechnical studies, including potentially employing concrete foundations for the panel frames. PV panels will have a maximum height of 5m.

ACTIVITY	DESCRIPTION
Construction of substation and inverters	The facility output voltage will be stepped up from medium voltage to high voltage in the transformer. The medium voltage cables will be run underground in the facility (except where a technical assessment suggest that overhead lines are applicable) to a common point before being fed to the onsite substation.
Establishment of ancillary infrastructure	Ancillary infrastructure will include a workshop, storage areas, office and a temporary laydown area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

4.6 ALTERNATIVES

4.6.1 NO-GO ALTERNATIVE

In the "no project" alternative, the proposed project will not be developed. In this scenario, there could be a missed opportunity to address the need for a just transition within the Province and Nationally. This project will also support the need to increase renewable energy generation in an effort to mitigate against concerns of climate change and exploitation of non-renewable resources. The no-go alternative would not assist in responding to the growing electricity demand in South Africa and would not contribute to the reliability of electricity supply at a national scale.

The proposed project is to assist with the repurposing of the Komati Power Plant. The "no project" alternative would result in the entire power station being dismantled without creating new infrastructure and repurposing of the plant.

The "no project" alternative will be considered in the EIA phase as a baseline against which the impacts of the proposed project will be assessed.

4.6.2 TECHNOLOGY

The project is utilising solar and BESS technology; therefore, no other technology alternatives are being considered for this project. Wind technology is being considered as a separate additional project at the Komati Power Station footprint.

With regards to the BESS, Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered during the assessment however the specific technology will only be determined following EPC procurement.

4.6.3 LOCATION

The selection of the location of the proposed project is based on the proximity to the Komati Power Station to allow the repurposing of existing infrastructure. Furthermore, the land chosen is owned by Eskom and would not result in the relocation of communities.

The site is considered suitable and the investigation of an alternative site is not currently proposed within this S&EIA.

4.7 NEED AND JUSTIFICATION

South Africa is faced with significant increases in electricity demand and a shortage in electricity supply. South Africa is the seventh largest coal producer in the world, with approximately 82% of the country's electricity

generated from coal. This large dependence on coal and its use has also resulted in a variety of negative environmental impacts, including the contribution to climate change. South Africa is also the highest emitter of GHGs in Africa; attributed to the country's energy-intensive economy that largely relies on coal-based electricity generation.

At the United Nations Framework Convention on Climate Change COP26 in November 2021, the governments of South Africa, with France, Germany, the United Kingdom, the United States of America, and the European Union – together forming the International Partners Group (IPG) – announced a new ambitious, long-term Just Energy Transition Partnership (JETP) to support the South Africa's decarbonisation effort in the context of domestic climate policy, including transitioning its economy towards cleaner energy sources. A distinguishing feature of the JETP is its emphasis on the centrality of a just transition in the structuring of the investment plan and financing package.

The JETP is a pathbreaking initiative and the first of its kind. It is long-term and ambitious in its aspiration to support South Africa's pathway to a low carbon economy and climate resilient society; to accelerate the just transition and the decarbonisation of the electricity system (including rehabilitation and repurposing of mines); and to support the development of new economic opportunities such as green hydrogen and electric vehicles amongst other interventions to support South Africa's shift towards a greener future (Source: https://ukcop26.org/six-month-update-on-progress-in-advancing-the-just-energy-transition-partnership-jetp/).

The EJETP aligns to international and national requirements to address climate change and move toward the use of cleaner technologies for the supply of electricity. JETP's vision focuses on achieving "Net Zero" carbon emissions by 2050, with an increase in sustainable jobs. Some of the additional benefits of moving towards lower carbon technologies, is the positive impact on air quality and water usage, the potential to create new exciting jobs, and a greater preservation of biodiversity in South Africa.

Over the next decade, more than half of the coal-fired power stations will be shut down, including Komati Power Station. While this will result in a lower impact on the environment, the shutdown of power stations will potentially lead to negative social impacts. The EJETP is aimed at, as far as possible, ensuring that the transition to cleaner technologies and the closure of power stations is carried out in a just way. The repurposing and repowering of Komati Power Station to utilise renewable energy is part of the EJETP.

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards GHG emissions and resultant climate change. The need and desirability of proposed Komati SEF and BESS project has been considered from an international, national and regional perspective.

4.7.1 INTERNATIONAL PERSPECTIVE

The proposed project will align with internationally recognised and adopted agreements, protocols and conventions. This includes the Kyoto Protocol (1997) which calls for countries internationally to reduce their GHG emissions through cutting down on their reliance on fossil fuels and investing in renewable energy technologies for electricity generation.

South Africa is also signatory to the United Nations' Development Programmes' (UNDP) Sustainable Development Goals (SDGs), particularly SGD 7 relating to affordable and clean energy. The proposed SEF qualifies as a clean technology that will generate 100MW of affordable energy to contribute to South Africa's energy mix.

The project will also greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of GHG emissions as soon as possible to achieve a climate-neutral world by 2050.

The authorisation of the Project will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the GHG concentrations in the atmosphere.

4.7.2 NATIONAL PERSPECTIVE

The proposed project will pave the way for the Just Energy Transition (JET)[3] in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed project is part of the EJETP for the repowering and repurposing of coal fired power stations which will come to the end of life in the next decade. Komati power station being the first power station to shut down in September 2022. This project will also contribute the introduction of cleaner technologies for the supply of electricity.

In terms of policy, the South African Government, through the IRP, has set a target to secure 17 800 MW of renewable energy by 2030. This is an effort to diversify the country's energy mix in response to the growing electricity demand and promote access to clean sources of energy.

The NDP is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources in order to move to less carbon-intensive electricity production. The Plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.

The authorisation of the proposed project will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilise the GHG concentrations in the atmosphere.

The proposed project will also aid in overcoming the power shortages that are currently faced in the country. Over the years, the construction of SEFs has become cheaper, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country.

In addition, the Council for Scientific and Industrial Research (CSIR) reported that renewable energy assisted in relieving pressure on the constrained South African power system during load shedding in the first quarter of 2019. This indicates that renewable energy is a key factor in ensuring that the country does not face further load shedding in the future.

4.7.3 REGIONAL AND LOCAL PERSPECTIVE

JUST ENERGY TRANSITION

Coal power stations and the coal mining industry play a vital component in the economic and social components of the local Mpumalanga economy. Shifting to a low carbon economy will thus need to offset or exceed the benefits being realised by fossil fuels in the province. Thus, a key factor to ensuring the success of the JET is not only to focus on the transition from fossil fuels to renewable energy resources but to simultaneously ensure that the power stations are repurposed to achieve a just process in Mpumalanga through new infrastructure and the Just Transition of jobs and skills.

MULTIPLE LAND USE

Unlike opencast coal mining within the broader Komati study area, the Project facilitates multiple land use functions within the development area. As solar modules are clustered on surface developments, this allows multiple land use functions. This will boost the economic activities in the area which will in turn increase job opportunities in that area and help improve the local community's welfare without jeopardising the environment.

DESIRABILITY OF THE PROJECT SITE

Four of Eskom's coal-fired power stations have been targeted for decommissioning in the short term: Komati, Camden, Grootvlei, and Hendrina. Eskom is looking to decommission 5 400MW of electricity from coal generation by the year 2022, increasing to 10 500MW by 2030, 22 000MW by 2035 and 35 000MW by 2050.

[3] The Just Transition is described as the transition towards a low-carbon and climate-resilient economy that maximises the benefits of climate action while simultaneously improving the welfare of the workers and their communities.

Simultaneously Eskom has been looking at options for repurposing these power stations with the core aims of reusing existing power transmission infrastructure, developing new generation capacity, providing ancillary services, and mitigating socio-economic impact. This project is one of several initiatives in which Eskom proposes.

5 ENVIRONMENTAL AND SOCIAL CONTEXT

This section provides context of the current environmental and social conditions of the project area. It highlights potential sensitive environmental and social features within the project area that will be further assessed by specialists in the EIA Phase. The Plan of Study for the Specialists during the EIA Phase is provided in **Section 8**.

5.1 PHYSICAL ENVIRONMENT

5.1.1 CLIMATE AND METEOROLOGY

*The following is extracted from the Air Quality Desktop Impact Assessment Report the Soil and Agricultural Potential Assessment compiled by WSP and included as **Appendix D-1 and Appendix G-3** respectively.*

METEOROLOGICAL OVERVIEW

To assess site-specific meteorological conditions, data was sourced from the South African Air Quality Information System (SAAQIS) for the Komati station and analysed for the best recovery period over the last five years; namely January to December 2018. The Komati station is owned by Eskom and is located on site.

The South African National Accreditation System (SANAS, 2012) TR 07-03 standards stipulate a minimum data recovery of 90% for the dataset to be deemed representative of conditions during a particular reporting period. The percentage recovery for parameters recorded is above 90 % and is thus considered reliable for use in this assessment.

TEMPERATURE, RAINFALL AND HUMIDITY

Rainfall in the area is almost exclusively in the form of showers and thunderstorms and falls mainly in the summer months from October to March. The maximum rainfall usually occurs in January. The winter months are usually dry. The mean annual precipitation for Catchment B11B is 687 mm and the mean annual evaporation is 1550 mm. Mean monthly evaporation exceeds the mean monthly precipitation for every month of the year thus this is a water deficit area.

The summer temperatures for the region averaged at 20 °C while winter temperatures averaged at 11 °C (**Figure 5.1**). Komati received approximately 1082 mm of rainfall for 2018. Higher rainfall occurred during the warmer summer months (December, January and February), with drier conditions during cooler winter months (June, July and August). It was noted that the month of March also experienced high volumes of rainfall (**Figure 5.2**). Relative humidity was generally moderate for 2018 at 63% (**Figure 5.2**).

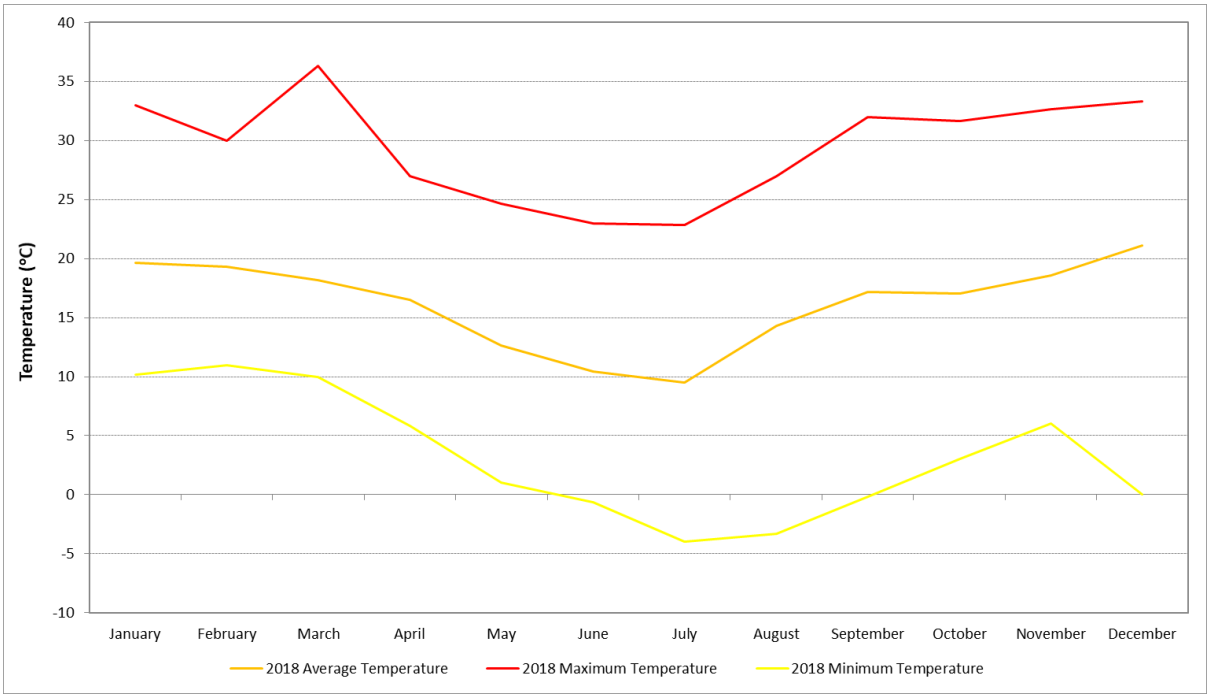


Figure 5.1: Average, maximum and minimum temperatures for the period January to December 2018 from the Komati station (SAAQIS)

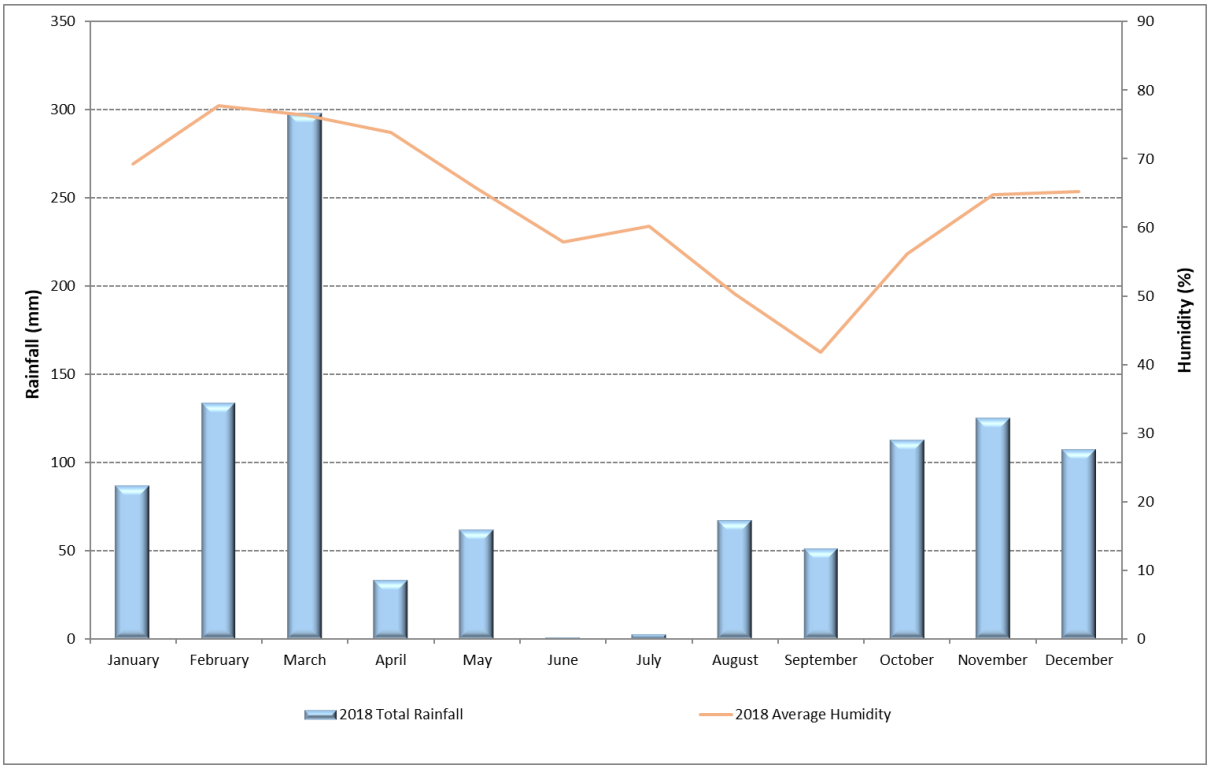


Figure 5.2: Monthly rainfall and average humidity for the period January to December 2018 from the Komati station (SAAQIS)

LOCAL WIND FIELD

Wind roses summarize wind speed and directional frequency at a location. Calm conditions are defined as wind speeds less than 1.0 m/s. Each directional branch on a wind rose represents wind originating from that direction. Each directional branch is divided into segments of colour, each representative of different wind speeds.

Typical wind fields are analysed for the full period (January to December 2018); diurnally for early morning (00h00–06h00), morning (06h00–12h00), afternoon (12h00–18h00) and evening (18h00–23h00); and seasonally for summer (December, January and February), autumn (March, April and May), winter (June, July and August) and Spring (September, October and November).

Wind roses from the Komati meteorological station are presented in **Figure 5.3** and are further discussed below:

- During the January to December 2018 period, light to strong north-north-easterly and westerly winds prevail in the region (calm conditions occurring 17 % of the time), with average wind speeds of 2.7 m/s expected.
- During the early morning hours (00h00-06h00) north-north-easterly, north-north-westerly, north and north-westerly winds prevail.
- Towards the latter morning (06h00-12h00) hours, a shift in winds is experienced with dominant winds from the west.
- In the afternoon (12h00-18h00) the westerly wind prevails.
- During the night (18h00-00h00) the north-north-easterly wind prevails yet again.
- Highest winds are experienced during the 12h00-18h00 period.
- Winds from the north-north-easterly prevail during the summer and autumn months whilst the winter and spring months show great directional variability. Additionally, winter and spring experience the strongest winds.

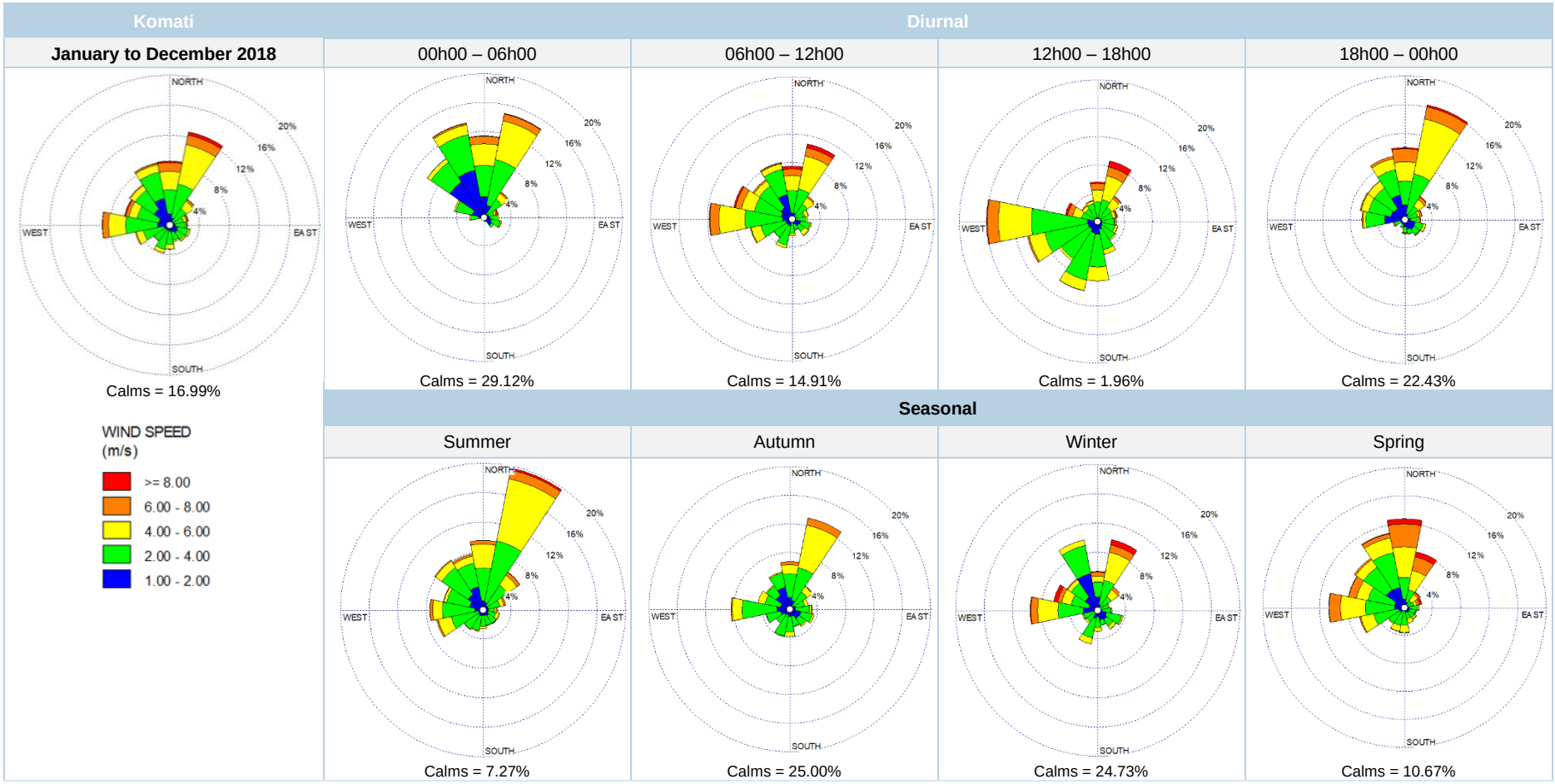


Figure 5.3: Local wind conditions for the period January to December 2018 from the Komati station (SAAQIS)

5.1.2 TOPOGRAPHY

The following is extracted from the Visual Scoping Assessment compiled by LOGIS and included as ***Appendix G-8.***

The surface topography of the area is typical of the Mpumalanga Highveld, consisting in the main of a gently undulating plateau. The flood plains of the local streams are at an average elevation of approximately 1595 meters above mean sea level (mamsl). The study area (**Figure 5.4**) is situated on land that ranges in elevation from approximately 1,530m (in the south-west of the study area) to 1,700m to the east. The project site itself is located at an average elevation of approximately 1,626m above sea level. The terrain morphological unit identified for the entire study area is described as undulating plains. The most prominent elevated topographical units are the ash dumps, slimes dams and mine dumps surrounding the power station and the Goedehoop Colliery located west of the power station.

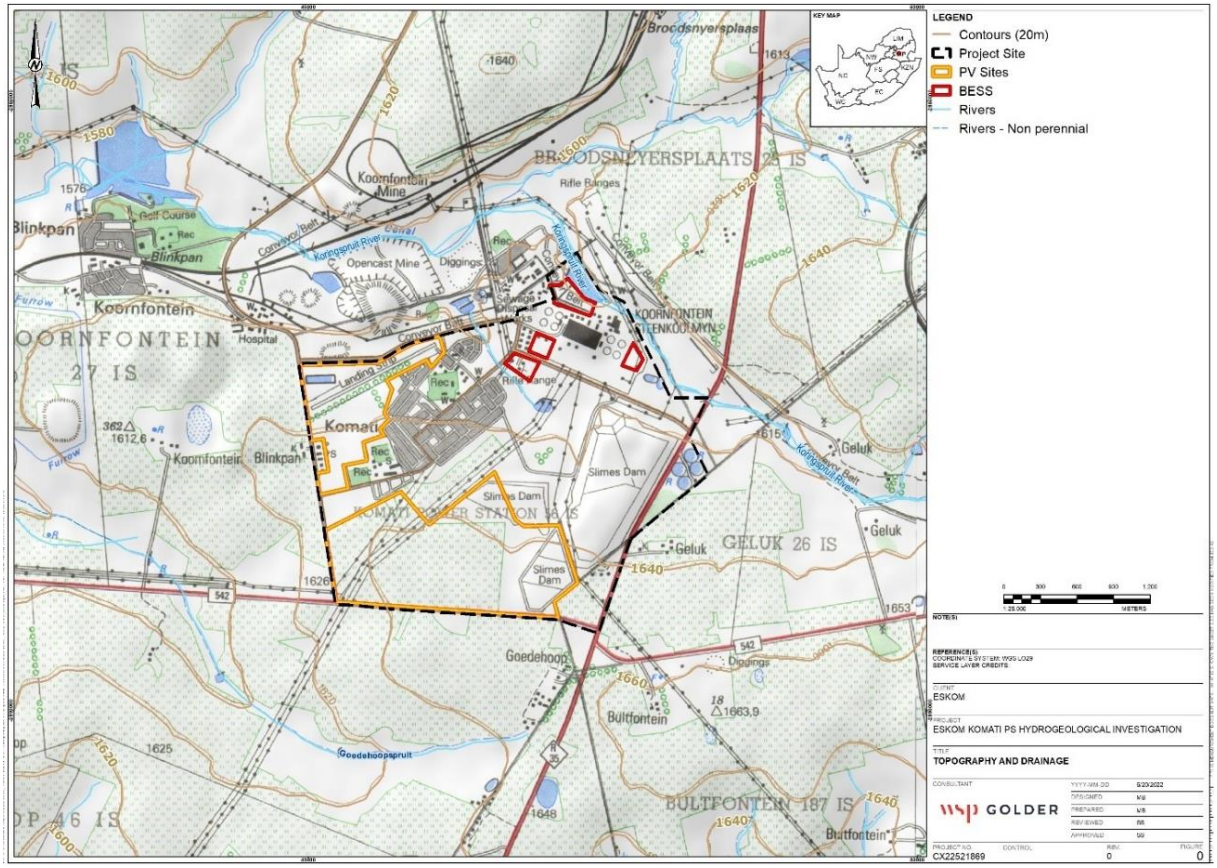


Figure 5.4: Topography

5.1.3 GEOLOGY

The following is extracted from the Palaeontology Desktop Assessment compiled by Dr H Fourie and included as ***Appendix G-7****.*

Large areas of the southern African continent are covered by the Karoo Supergroup (**Figure 5.5**). It covers older geological formations with an almost horizontal blanket. Several basins are present with the main basin in the central part of south Africa and several smaller basins towards Lebombo, Springbok Flats and *Soutpansberg*. An estimated age is 150 – 180 Ma. And a maximum thickness of 7000 m is reached in the south. Three formations overlie the Beaufort Group, they are the *Molteno, Elliot and Clarens* Formations. The Elliot Formation is also known as the Red Beds and the old Cave Sandstone is known as the *Clarens* Formation. At the top is the

Drakensberg Basalt Formation with its pillow lavas, *pyroclasts*, etc. (Kent 1980, Snyman 1996). The Beaufort Group is underlain by the *Ecca* Group which lies on the *Dwyka* Group.

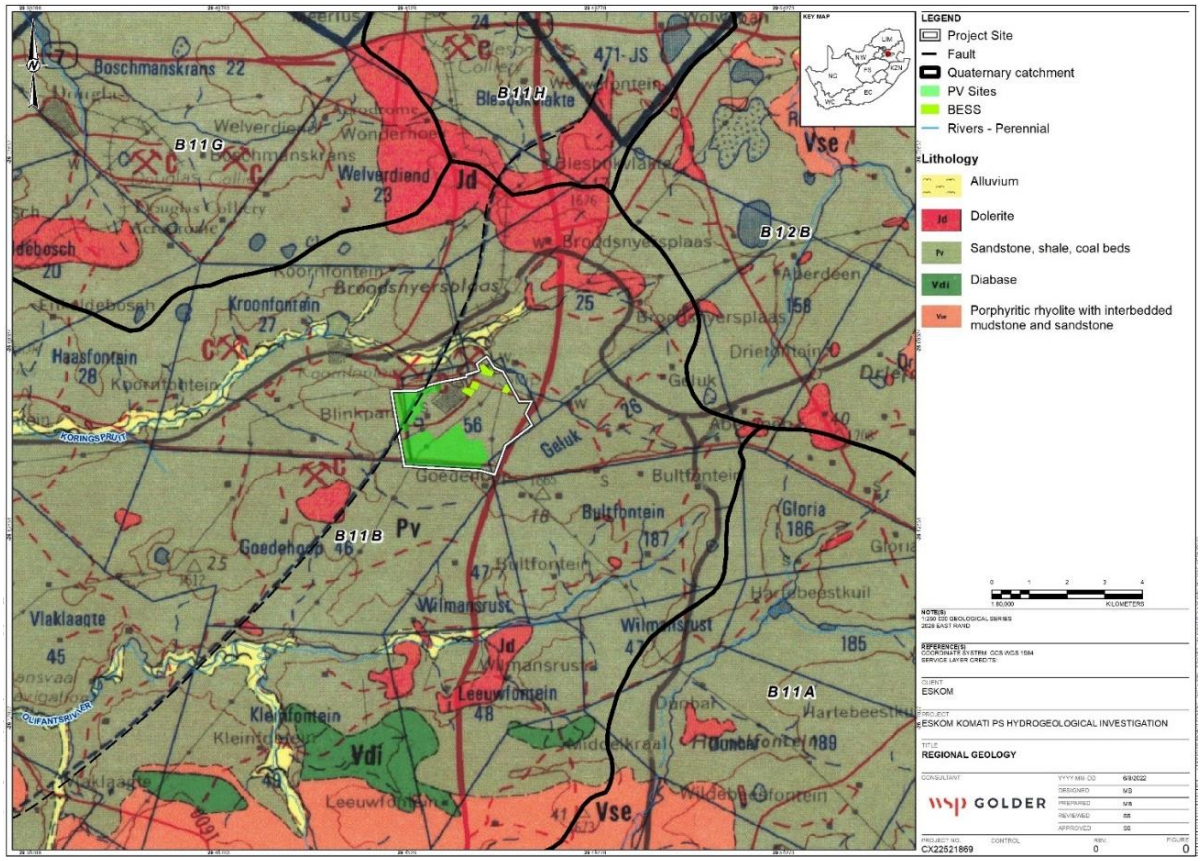


Figure 5.5: Geological map of the area

Dolerite dykes occur throughout the Karoo Supergroup. Structural geological features such as dykes and faults can have a measurable influence on ground water flow and mass transport. Permian sediments are extensively intruded and thermally metamorphosed (baked) by sub-horizontal sills and steeply inclined dykes of the Karoo Dolerite Suite. These early Jurassic (183 Ma) basic intrusions baked the adjacent mudrocks and sandstones to form splintery hornfels and quartzites respectively. Thermal metamorphism by dolerite intrusions tends to reduce the palaeontological heritage potential of the adjacent sediments.

The *Ecca* Group is early to mid-Permian (545-250 Ma) in age. Sediments of the *Ecca* group are lacustrine and marine to fluvio-deltaic (Snyman 1996). The *Ecca* group is known for its coal (mainly the Vryheid Formation) (five coal seams) and uranium. Coalfields formed due to the accumulation of plant material in shallow and large swampy deltas (see Appendix 1). The *Ecca* Group conformably overlies the *Dwyka* Group and is conformably overlain by the Beaufort Group, Karoo Supergroup. It consists essentially of mudrock (shale), but sandstone-rich units occur towards the margins of the present main Karoo basin in the south, west and north-east, with coal seams also being present in the north-east (Kent 1980, Johnson 2009).

The Vryheid Formation is named after the type area of Vryheid-*Volksrust*. In the north-eastern part of the basin the Vryheid Formation thins and eventually wedges out towards the south, southwest and west with increasing distance from its source area to the east and northeast (Johnson 2009). The Vryheid Formation consists essentially of sandstone, shale, and subordinate coal beds, and has a maximum total thickness of 500 m. It forms part of the Middle *Ecca* (Kent 1980). This formation has the largest coal reserves in South Africa. The pro-delta sediments are characterised by trace and plants fossils (Snyman 1996).

Coal has always been the main energy source in industrial South Africa. It is in Mpumalanga, south of the N4, that most of the coal-fired power stations are found. Eskom is by far the biggest electricity generator in Africa. Thick layers of coal just below the surface are suited to open-cast mining and where the overlying sediments are

too thick, shallow underground mining. In 2003, coal was South Africa's third most valuable mineral commodity and is also used by Sasol for fuel- and chemicals-from-coal (Norman and Whitfield 2006). *Grodner* and *Cairncross* (2003) proposed a 3-D model of the Witbank Coalfield to allow easy evaluation of the sedimentary rocks, both through space and time. Through this, one can interpret the environmental conditions present at the time of deposition of the sediments. This can improve mine planning and mining techniques. The *Vryheid* Formation is underlain by the *Dwyka* Group and is gradually overlain by mudstones (and shale) and sandstones of the *Volksrust* Formation. The typical colours for the Vryheid Formation are grey and yellow for the sediments and black for the coal seam. The thickness of the grey shale can vary and this is interlayered with the also variable yellow sandstone and coal seams.

Ecca rocks are stable and lend themselves well to developments. It is only unstable in or directly above mining activities (Snyman 1996). Dolerite dykes occur throughout the Karoo Supergroup. Structural geological features such as dykes and faults can have a measurable influence on ground water flow and mass transport. The Vryheid Formation sediments may attain a thickness of 120 – 140 m. A typical profile includes soil and clay, sandstone and siltstone, shale, 2 upper seam, shale, 2 seam, sandstone, no 1 seam, shale and dolomite at the bottom. The typical colours for the *Vryheid* Formation are grey and yellow for the sediments and black for the coal seam. The thickness of the grey shale can vary and this is interlayered with the also variable yellow sandstone and coal seams.

5.1.4 SEISMICITY

The following is extracted from the Geotechnical Desktop Study compiled by Eskom Holdings SOC (Ltd) and included as ***Appendix G-13****.*

The South African National Standards (SANS) code (Seismic actions and general requirements for buildings) SANS 10160-4:2011, shows that the site is situated in the area where the peak ground acceleration has a probability of being exceeded in 50 year period is 0.1g.

Figure 5.6 shows the zone (Zone 1) where compliance with the minimum requirements is specified by the code. Zone 1 is defined as "Regions of natural seismic activity".

A more recent illustration produced by the Council of Geoscience is presented in **Figure 5.7**, showing peak ground acceleration with a 10% probability of being exceeded in 50 years. On this figure, the five sites are classified with ground acceleration of 0.1g (98cm/sec²)

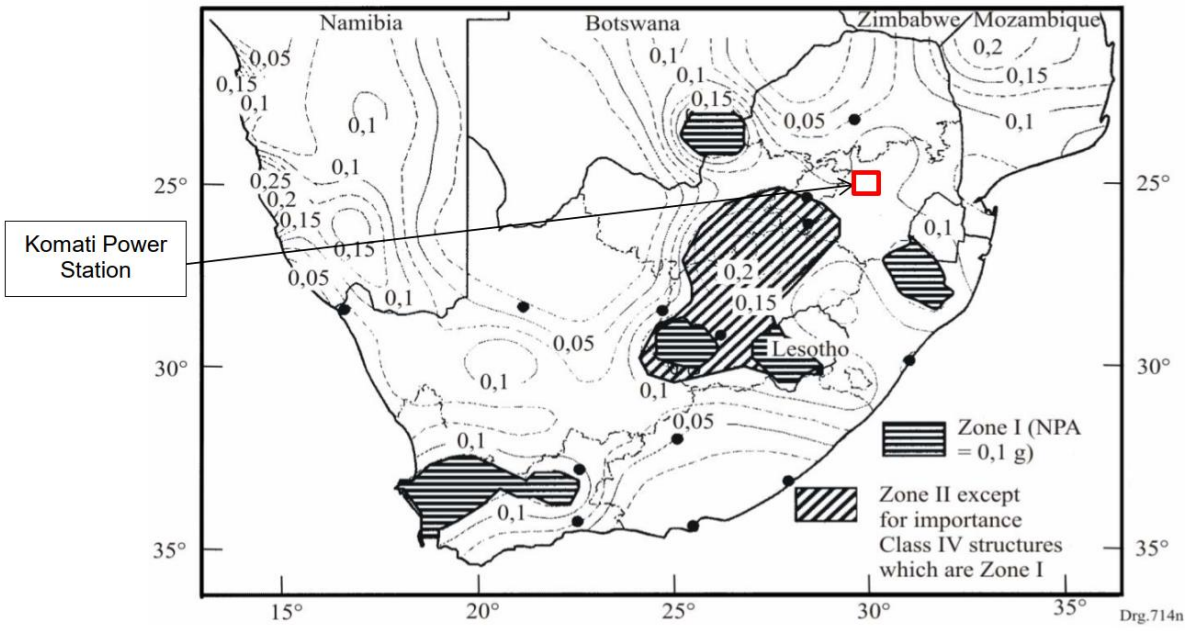


Figure 5.6: Seismic Hazard map and Zones (Source: Eskom, 2022)

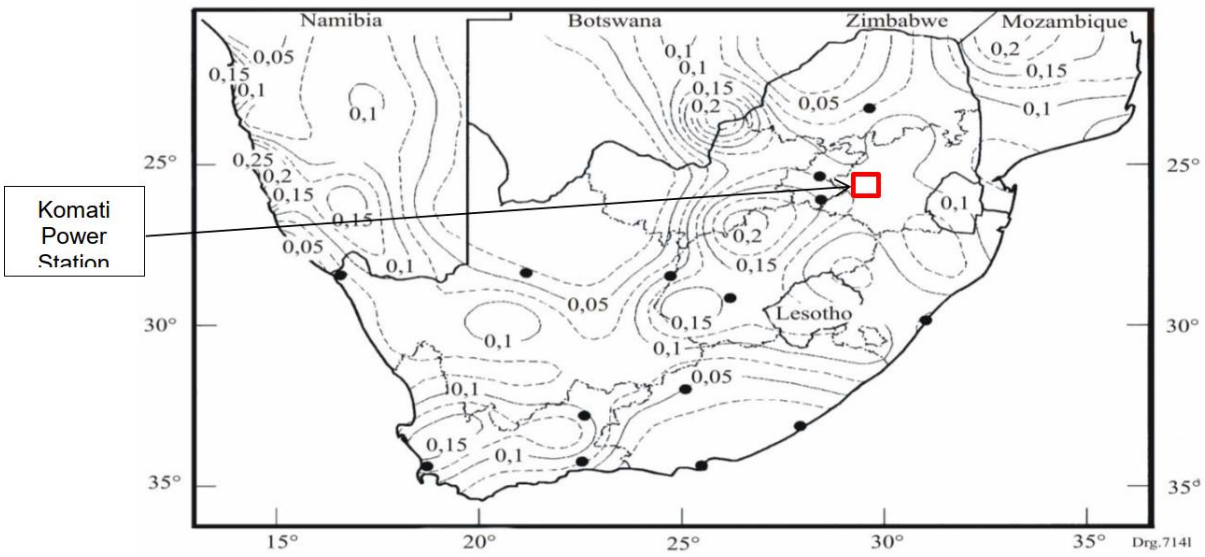


Figure 5.7: A recent seismic hazard map (2003) obtained from the Council for Geoscience (Source: Eskom, 2022)

5.1.5 AIR QUALITY BACKGROUND

*The following is extracted from the Air Quality Desktop Impact Assessment Report compiled by WSP and included as **Appendix G-1**.*

Existing air pollution sources in the vicinity of the proposed project include:

- Agricultural activities mostly from maize and livestock.
- Vehicle emissions from the R35, R542, nearby Goedehoop Colliery and internal Komati power station roads.
- Mining activities from the nearby Goedehoop Colliery.
- Industrial activities from the Komati Power Station.
- Domestic fuel burning from the Komati Village and nearby residential areas.
- Dust from unpaved roads from the nearby Goedehoop Colliery.
- Other fugitive dust sources such as wind erosion of exposed areas.

Background concentrations for particulate matter (i.e most specifically particle size of aerodynamic diameter of less than 10 and 2.5 microns (PM_{10} and $PM_{2.5}$)) were also sourced from the SAAQIS for the Komati station to evaluate the current situation within the receiving environment. The best recovery period over the last five years; namely January to December 2018 was utilized. Annual averages for PM_{10} and $PM_{2.5}$ were 62.7 µg/m^3 (above the annual average PM_{10} standard of 40 µg/m^3) and 6.5 µg/m^3, respectively (below the annual average $PM_{2.5}$ standard of 20 µg/m^3). The high existing sources of emissions for PM_{10} are likely a result of the abovementioned background sources, however it must be noted that the background concentrations are likely to decrease once the existing Komati Power Station is fully decommissioned,, possibly resulting in compliance with the annual average PM_{10} standard of 40 µg/m^3. Further, the data recovery for PM_{10} and $PM_{2.5}$ was 82% and 85%, respectively, slightly below the recommended data recovery of 90% for the dataset to be deemed reliable.

Table 5.1 presents the sensitive receptors within the surrounding environment. Sensitive receptors are defined by the United States Environmental Protection Agency as areas where occupants are more susceptible to the adverse effects of exposure to pollutants. These areas include but are not limited to residential areas, hospitals/clinics, schools and day care facilities and elderly housing. The site layout and receptors are presented in **Figure 5.8**.

Table 5.1: Sensitive receptors within a 10 km radius of the proposed project

ID	SENSITIVE RECEPTOR NAME	LATITUDE (S)	LONGITUDE (E)	DISTANCE FROM SITE BOUNDARY (KM)	DIRECTION FROM SITE
SR1	Komati Village	26° 5'46.52"	29°27'37.62"	Within the boundary	
SR2	Residential Area 1	26° 8'37.05"	29°32'5.14"	7.3	Southeast
SR3	Residential Area 2	26° 4'9.85"	29°25'16.62"	3.7	Northwest
SR4	Residential Area 3	26° 5'14.28"	29°26'18.46"	1.2	Northwest
SR5	Residential Area 4	26° 5'24.70"	29°26'47.50"	0.4	Northwest
SR6	Residential Area 5	26° 2'5.40"	29°31'6.68"	7.2	Northeast

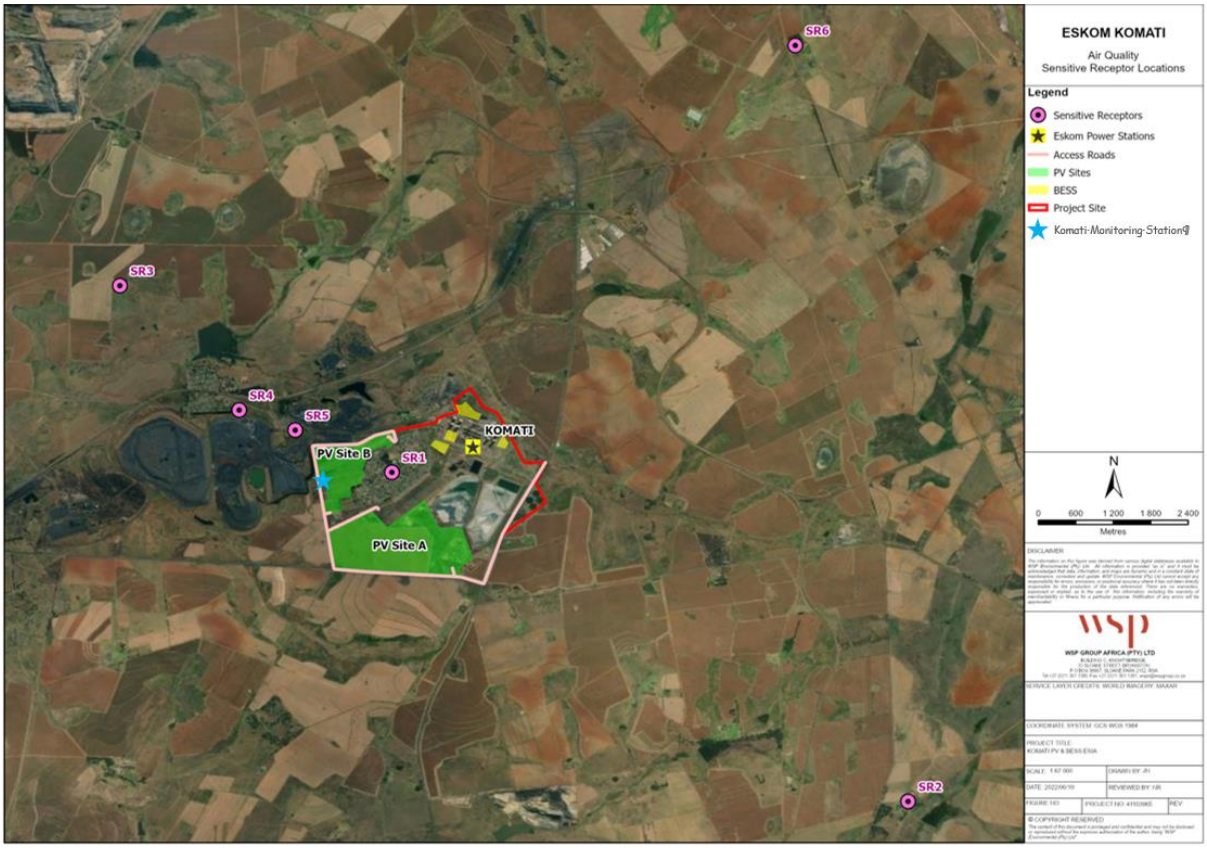


Figure 5.8: Site layout and sensitive receptors for the proposed project

5.1.6 NOISE

The following is extracted from the Noise Desktop Impact Assessment Report compiled by WSP and included as ***Appendix G-2****.*

Existing noise sources in the vicinity of the proposed project include:

- Agricultural activities mostly from maize and livestock.
- Vehicles along the R35, R542, nearby Goedehoop Colliery and internal Komati power station roads.
- Mining activities from the nearby Goedehoop Colliery.
- Industrial activities from the Komati Power Station.

Sensitive receptors are identified as areas that may be impacted negatively due to noise associated with the proposed project. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. The site layout and receptors are presented in **Table 5.2** and **Figure 5.9**.

Table 5.2: Sensitive receptors within a 5 km radius of the proposed project

ID	SENSITIVE RECEPTOR NAME	LATITUDE (S)	LONGITUDE (E)	DISTANCE FROM SITE BOUNDARY (KM)	DIRECTION FROM SITE
SR1	Komati Village	26° 5'46.52"	29°27'37.62"	Within the boundary	
SR2	Residential Area 1	26° 4'9.85"	29°25'16.62"	3.7	Northwest
SR3	Residential Area 2	26° 5'14.28"	29°26'18.46"	1.2	Northwest
SR4	Residential Area 3	26° 5'24.70"	29°26'47.50"	0.4	Northwest

Figure 5.9: Site layout and sensitive receptors for the proposed project

5.1.7 SURFACE WATER

The following is extracted from the Surface Water Scoping Assessment compiled by WSP and included as ***Appendix G-4****.*

Komati Power Station occurs within the upper Olifants WMA, in the B11B quaternary catchment (**Figure 5.10**) and can be sub-divided into secondary drainage regions compromising of smaller streams and creeks. This catchment receives 687 mm rainfall per year and experiences 1550 mm of evaporation annually. The surface topography of the area is typical of the Mpumalanga Highveld, consisting in the main of a gently undulating plateau. The flood plains of the local streams are at an average elevation of approximately 1595 mamsl. Altitudes vary from ±1650 mamsl at the higher parts south of the ashing facility to ±1595 mamsl which defines the base of the Koring Spruit to the north of the Komati Power Station.

The Koringspruit River flows past the northern boundary. The Koringspruit also passes the Koornfontein and Goedehoop Coal mines and joins the Olifants River some 15 km downstream of the Project Site. An unnamed tributary of the Komatispruit originates in the Ashing area and drains the area west of the Ashing Area to the Komatispruit. The Gelukspruit flows in a northwesterly direction and drains the area east and north of the Project Site towards the Koringspruit. According to Mathetsa, & Swatz, 2019, this stream was diverted to prevent ingress into power plant areas and remains so due to the location of the current Komati Power Station activities. Several drains and dams have been constructed around the ashing area, Power Plant area and Coal Stockyard area. A seepage area/drainage line within the dirty water area of the existing ash dams is noted by Mathetsa, 2021 probably containing seepage off the ash dams, which have been used as water storage facilities. Surface run-off from the area is in the order of 5% of the annual rainfall.

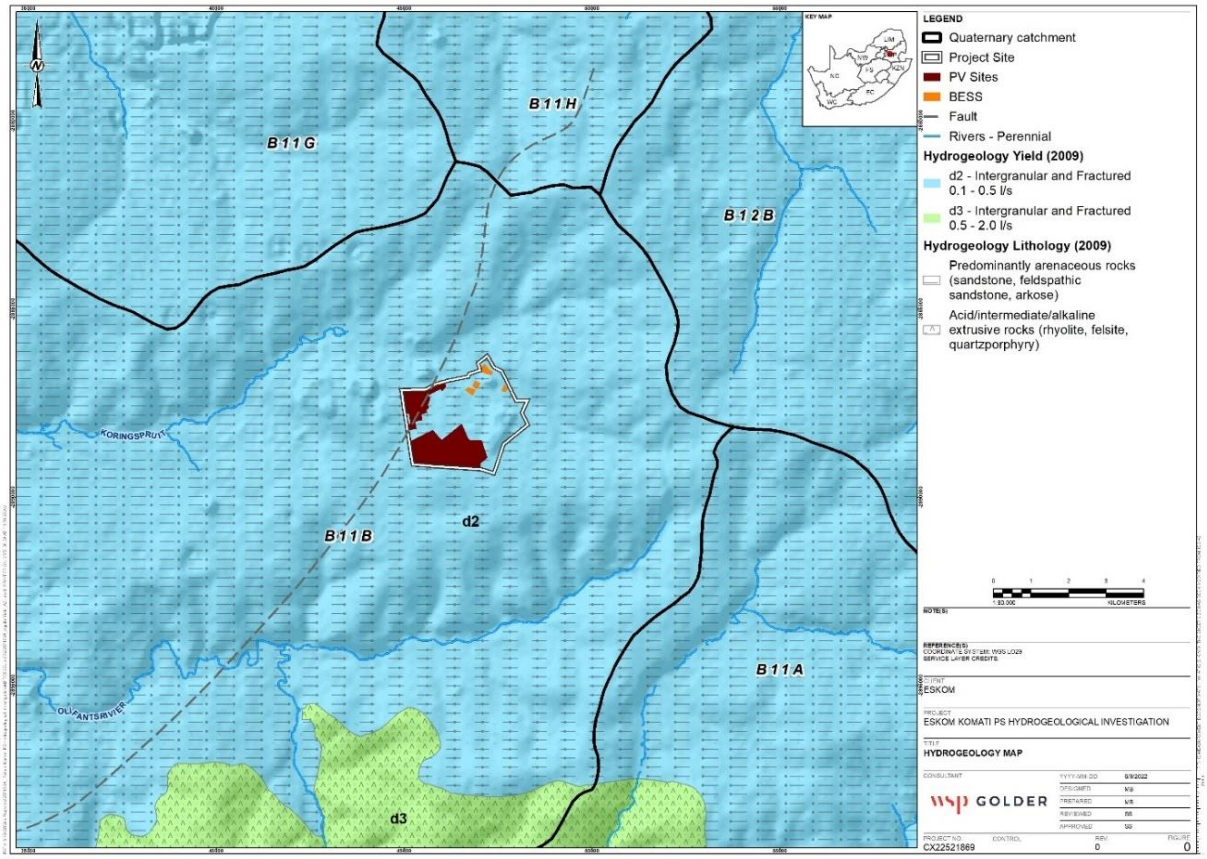


Figure 5.10: Quaternary catchment of the project area and surrounds

5.1.8 GROUNDWATER

The following is extracted from the Groundwater Assessment compiled by WSP and included as ***Appendix G-12****.*

The area of investigation is indicated in **Figure 5.11**.

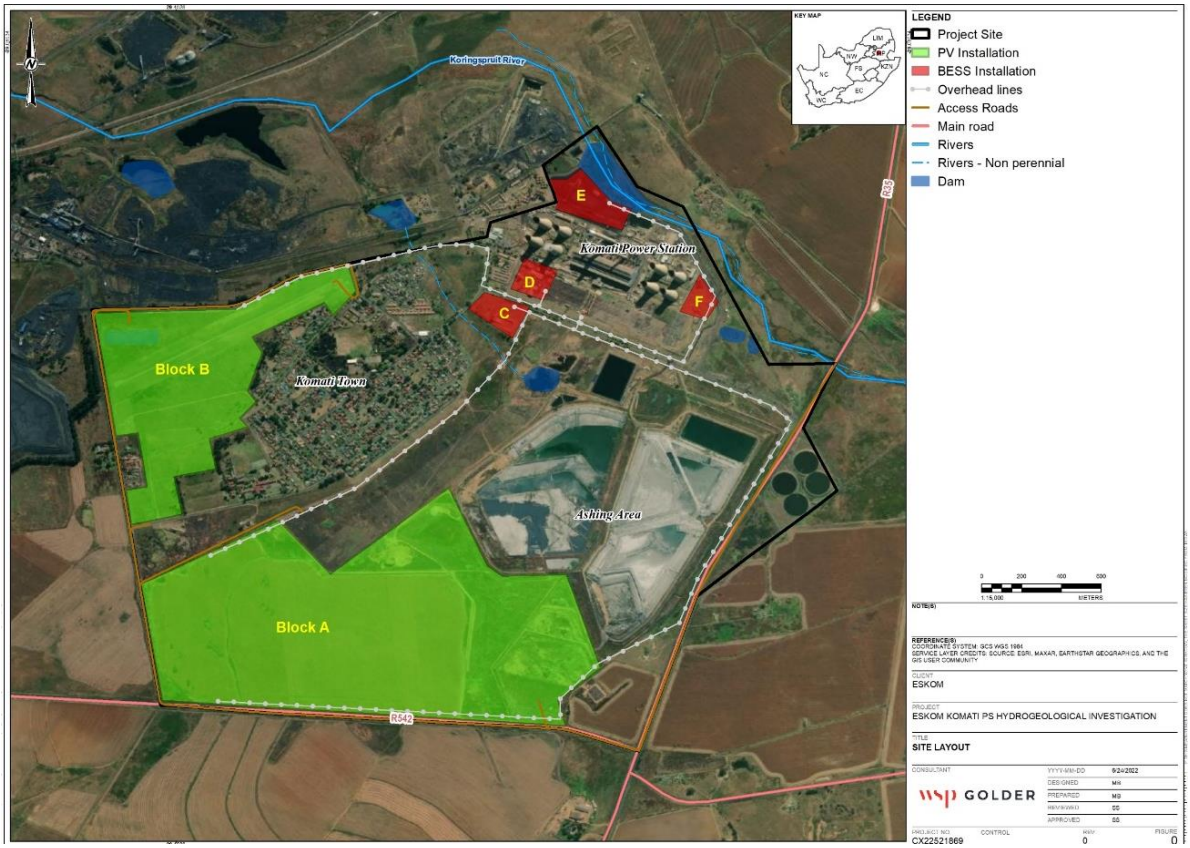


Figure 5.11: Groundwater investigation area

HYDROGEOLOGY

UNSATURATED ZONE

This zone is conceptualized (Halenyane, 2019) as an upper zone of completely weathered material to a depth of 8 to 10 m. This layer is anticipated to have a higher hydraulic conductivity (k of 1 m/d) compared to the underlying rock matrix but is generally unsaturated. However, a seasonal aquifer perched on the bedrock may occur on this layer after high rainfall events.

SATURATED ZONE

Halenyane, 2019 and Van Niekerk & Staats, 2009 suggests that multiple aquifer types are represented at the site. These include:

- Shallow aquifer with colluvial and alluvial matrix, the shallow aquifer is composed of weathered upper *Ecca* formation sediments, is seasonal, discontinuous and perched above the more competent bedrock layers.
- Semi-confined aquifers within the Vryheid Formation. These aquifers are commonly confined along essentially horizontal bedding interfaces between different lithologies but can be locally unconfined along the trend of fractures zones, which allows the aquifers to recharge seasonally. This is considered to be the regional aquifer within the Project Site occurring below the unsaturated zone in slightly weathered or fractured bedrock to a depth of approximately 30 m with a low k (0,001 – 0,1 m/d). Halenyane, 2019 notes that the permanent groundwater level resides in this unit and is about 1 to 10 metres below ground level. The groundwater flow direction in this unit is influenced by regional topography and for the site flow would be in general from high lying areas to the Koringspruit. This aquifer is likely to be highly heterogeneous.
- Deeper confined aquifers within basement lithologies.

HYDRAULIC CONDUCTIVITY

Hydraulic conductivity was estimated based on falling head tests (Van Niekerk & Staats, 2009) as ranging from 0,007 m/d at AB07 to 2.4 m/d for AB04 with an average of 0,51 m/d. Porosity was estimated as 0,3.

GROUNDWATER LEVELS

A hydrocensus (**Figure 5.12**) was carried out in 2008 (GHT Consulting, 2009) with selected points (thirteen) resampled in 2019 (Eskom, 2019). These covered an approximate 15 km radius around KPS. The results of the hydrocensus imply that the surrounding farms to the east, southeast and southwest of KPS obtain water from boreholes for domestic use and for irrigation of crops. The closest boreholes are located within 500 m of the Eskom boundary on the farms Goedehoop, Geluk and Broodsnyders with details included in **Table 5.3**. Boreholes identified on the National Groundwater Archive were confirmed to be beyond 1 km of the farm boundary.

Table 5.3: Hydrocensus Boreholes

ID	LONGITUDE (E)	LATITUDE (S)	DEPTH (MBGL)	USE	WATER LEVEL (MBCL)	CONDITION
BB20	29.48213	26.08393	26.1	Domestic Drink	14.10	Good
BB21	29.47954	26.10598	26.8	~	2.20 (2008); 1.76 (2019)	Windmill (2019)
BB22	29.47907	26.10586	~	Domestic Drink	~	Good
BB23	29.47905	26.10632	11.0	Domestic Drink	4.50	Broken (2008) indicated to be in use 2019
BB24	29.47125	26.11574	~	Domestic Drink	15.00	Good
BB25	29.47127	26.11574	26.5	Domestic Drink. Livestock	20.50	Good
BB26	29.47783	26.11699	6.1	~	Dry	Dry hole
BB27	29.47912	26.11710	42.0	Domestic Drink. Livestock	32.00	Good
BB43	29.42195	26.12209	15.0	Domestic Drink	8.00	Good

ID	LONGITUDE (E)	LATITUDE (S)	DEPTH (MBGL)	USE	WATER LEVEL (MBCL)	CONDITION
BB44	29.42193	26.12198	55.0	Domestic Drink. Livestock	5.00	Good
BB45	29.41625	26.11591	~	~	~	Not in use for a long time
BB46	29.42719	26.11853	~	~	~	Not in use for a long time

Water levels typically vary from around 1.4 to 12 meters below ground level (mbgl) with shallow groundwater at surface in AK62 between the Raw Water dams and Ashing Area. Eskom, 2021 indicates that the groundwater flow mimics the topography, and the direction of flow is towards the surface stream, particularly the Koringspruit. A comprehensive numerical groundwater model has been compiled for the KPS area as detailed by Kimopax, 2019 and also indicates that contamination is anticipated to migrate from the pollution sources towards the Koringspruit to the north.

SRK 5666657 (2020) report that water levels have been lowered through dewatering of mine workings at Goodehoep Collieries. Water levels in the monitoring boreholes at Komati Power Station vary only slightly over time and do not appear to have been affected by dewatering at Goodehoep at the present time.

Mathetsa, 2021 indicates that the groundwater flow mimics the topography and the direction of flow are towards the surface stream, particularly the Koringspruit. There is little seasonal variation noted. The contoured groundwater level is provided after Halenyane, 2019 (**Figure 5.13**).

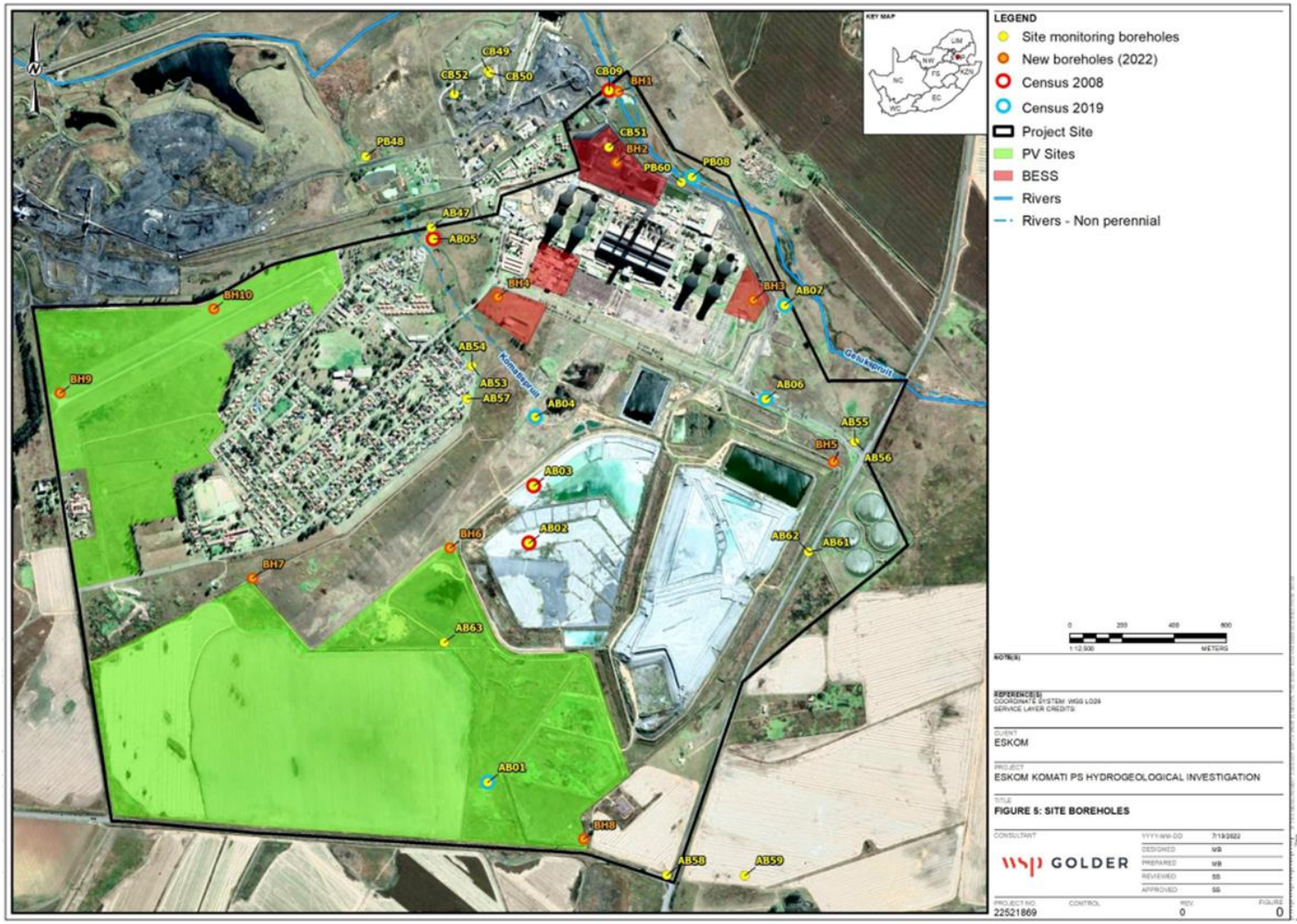


Figure 5.12: Hydrocensus

GROUNDWATER QUALITY

Water quality data is captured in the WISH database for all parameters. Groundwater quality parameters that need to be analysed are specified in the WUL (Appendix IV, Table 6 Clause 3.6) as pH, Electrical conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Total Alkalinity, chloride (as Cl), sodium (as Na), sulphate, nitrate, ammonia, orthophosphate, fluoride, potassium, manganese, copper, iron, zinc, arsenic and chromium.

The groundwater reserve is conservative and provides several determinants at concentrations which exceed baseline groundwater quality. As a result, several parameters are not in compliance with the WUL. The groundwater quality is generally alkaline with an average pH of 8,3 at the upstream ambient boreholes (AB58 and AB59). The 95th percentile results being higher at 9.1. The pH is slightly lower in the boreholes located around the proposed areas with average pH varying from 7.2 to 8. Electrical conductivity (EC) in the ambient boreholes (average 17 and 32 mS/m for AB58 and AB58 respectively) is below the groundwater reserve of 112 mS/m. EC is comparatively elevated at some of the boreholes in the proposed areas with the 95th percentiles for EC exceeding ambient groundwater quality and the reserve for AB01, AB07, CB51, CB09, PB60. The localised increase in salinity is associated with elevated chloride, sulphate, calcium, magnesium, and sodium. Flouride is near the groundwater reserve of 0,4 mg/l in the ambient boreholes (95th percentile of 0,3 and 0,4 mg/l) and is locally elevated particularly in the coal stock yard area (Block E) with the 95th percentile of 1.1 mg/l at CB09 and 0,5 mg/l at the boundary of the Komati Power Station at PB60.

Metal concentrations for iron (95th percentile of 3.7 to 5.3 mg/l) and manganese (95th percentile of 6.6 mg/l) are slightly elevated compared to the ambient groundwater quality (<0,1 for iron and <0,5 for manganese) at AB07 (downgrade of the Ash dams) and in CB09 (coal stockyard). Arsenic is reported at below detection.

Water quality is locally affected by Komati Power Station activities particularly from the Ash Dam Facilities and coal stockyard. A pollution plume is anticipated to migrate from the pollution sources towards the Koringspruit to the north.

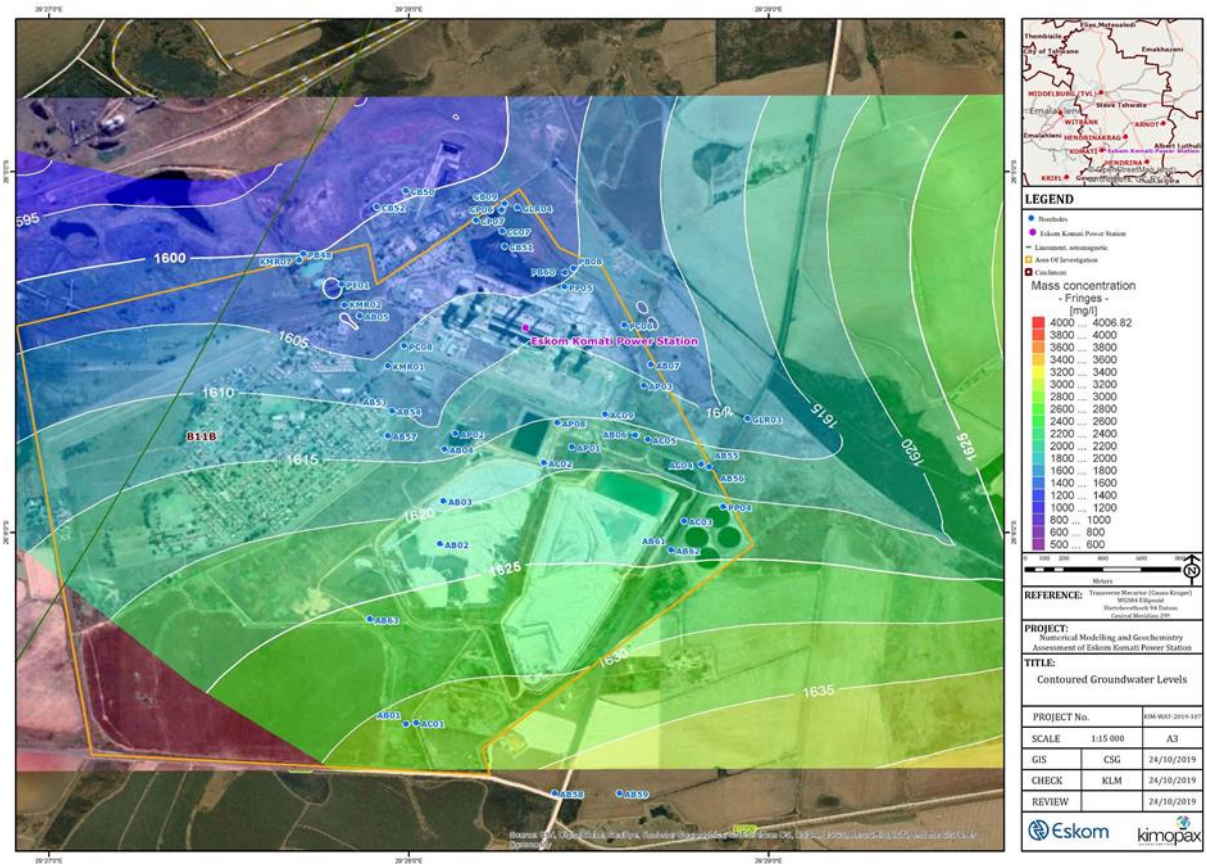


Figure 5.13: Groundwater contours (Halenyane, 2019)

AQUIFER CHARACTERISATION

GROUNDWATER VULNERABILITY

The Project Site is vulnerable to groundwater contamination due to the shallow water table. This is mitigated by the low conductivity and low recharge. Due to the surrounding use of groundwater by communities, the aquifer is considered to have a high vulnerability to contamination as is indicated by the observed localised impact from existing sources.

AQUIFER CLASSIFICATION

The aquifer is classified as a Minor aquifer (Parsons1, 1995; DWAF2, 1998) or Poor (DEA3, 2010) due to the low exploitation potential and low yields. It does, however, represent an important source of water for domestic supply to the local communities.

A hydro-census was carried out in 2008 (Van Niekerk & Staats, 2009) with selected points (thirteen) resampled in 2019 (Mathetsa & Swatz, 2019) (**Figure 5.12**). These covered an approximate 15 km radius around Komati Power Station.

The census boreholes are focused in the area to the north-east of Komati Power Station. The results of the hydro-census confirmed the following:

- Water quality analyses was carried out on the hydro-census boreholes. This confirmed that concentrations were generally below the SANS 241:2015 limits for domestic use and is therefore suitable for drinking (based on the parameters analysed).
- Groundwater is utilized for domestic use with ad hoc use for irrigation.

As seen in **Figure 5.12,** the hydro-census boreholes are located outside of the project area and Komati Village. The boreholes are used by farmers mainly for Domestic Drinking Water and Livestock.

For full context refer to Section 3.2 of the Groundwater Assessment (**Appendix G-12**).

Komati Power Station operates a water treatment plant which supplies water to certain communities. The facility's capacity is 4.3 ML/day for potable water and 5.7 ML/day for demineralized water (Urban-Econ, 2020). The source of water for the project will be from the existing Water Treatment Plant at the Power Station.

AQUIFER PROTECTION CLASSIFICATION

A weighting and rating approach is used to decide on the appropriate level of groundwater protection (**Table 5.4**). After rating the aquifer system management and the aquifer vulnerability, the points are multiplied to obtain a Groundwater Quality Management (GQM) index.

Table 5.4: Ratings for the Aquifer Quality Management Classification System

AQUIFER CHARACTERISATION		VULNERABILITY	
CLASS	**POINTS**	**CLASS**	**POINTS**
Sole Source Aquifer System	6	High	3
Major Aquifer System	4	Medium	2
Minor Aquifer System	2	Low	1
Non-Aquifer System	0		

Table 5.5: Appropriate level of groundwater protection required

GQM INDEX	LEVEL OF PROTECTION
<1	Limited Protection

1 – 3	Low Level Protection
4 – 6	Medium Level Protection
7 – 10	High Level Protection
>10	Strictly Non-degradation

Table 5.6: Aquifer classification and vulnerability assessment

DESCRIPTION	AQUIFER	VULNERABILITY	RATING	PROTECTION
Regional Aquifer	Minor (2)	1-2	4	Medium

The above classification implies that the regional aquifer is less sensitive due to the low recharge and low conductivity (k) and hence a medium level of protection is required.

For full context refer to Section 5 of the Groundwater Assessment (**Appendix G-12**).

5.1.9 SOILS AND LAND CAPABILITY

*The following is extracted from the Soil and Agricultural Potential Assessment compiled by WSP and included as **Appendix G-3**.*

SOIL CLASS

The dominant soil classes database was created for assessing the agricultural potential of soils in conjunction with other soils properties such as depth, texture together with rainfall data. Dominance in this context is referred to a class having 40% or more of a single constituent. The aim was to establish a manageable number of classes that would not be too general for making various interpretations.

The study site incorporated two soil classes (**Figure 5.14**):

- **Soil Class S3:**
  - Description: Red or yellow structureless soils with a plinthic horizon.
  - Favourable Properties: Favourable water holding properties.
  - Limitations: Imperfect drainage, unfavourable in high rainfall areas.
- **Soil Class S17:**
  - Description: Comprises of an association of classes 1 to 4 - Undifferentiated structureless soils.
  - Favourable Properties: Favourable physical properties.
  - Limitations: One or more of; low base status, restricted soil depth, excessive or imperfect drainage, high erodibility.

LAND CAPABILITY

The classic eight-class land capability system (Klingebiel & Montgomery,1961) was adapted for use with GIS in South Africa, taking data availability into account by Schoeman et al., 2000.

Land capability classes are interpretive groupings of land units with similar potentials and continuing limitations or hazards. Land capability involves consideration of (i) the risks of land damage from erosion and other causes and (ii) the difficulties in land use owing to physical land characteristics, including climate. Social and economic variables are not considered. Class concepts are set out in Table 5.7 and broad land use options in the Table 5.8.

The study site incorporated two soil classes (**Figure 5.15**). These are elaborated below:

- **Land Capability Class II:**

- Land in Class II has some limitations that reduce the choice of plants or require moderate conservation practices; it may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I where the limitations are few and the practices are easy to apply.

- **Land Capability Class IV:**
  - Land in Class IV has very severe limitations that restrict the choice of plants, require very careful management, or both. It may be used for cultivated crops, but more careful management is required than for Class III and conservation practices are more difficult to apply and maintain; restrictions to land use are greater than those in Class III and the choice of plants is more limited.

Table 5.7: Land Capability: Class Concepts

Class	Concepts
I	Land in Class I has few limitations that restrict its use; it may be used safely and profitably for cultivated crops; the soils are nearly level and deep; they hold water well and are generally well drained; they are easily worked, and are either fairly well supplied with plant nutrients or are highly responsive to inputs of fertilizer; when used for crops, the soils need ordinary management practices to maintain productivity; the climate is favourable for growing many of the common field crops.
II	Land in Class II has some limitations that reduce the choice of plants or require moderate conservation practices; it may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I; the limitations are few and the practices are easy to apply.
III	Land in Class III has severe limitations that reduce the choice of plants or require special conservation practices, or both; it may be used for cultivated crops, but has more restrictions than Class II; when used for cultivated crops, the conservation practices are usually more difficult to apply and to maintain; the number of practical alternatives for average farmers is less than that for soils in Class II.
IV	Land in Class IV has very severe limitations that restrict the choice of plants, require very careful management, or both; it may be used for cultivated crops, but more careful management is required than for Class III and conservation practices are more difficult to apply and maintain; restrictions to land use are greater than those in Class III and the choice of plants is more limited.
V	Land in Class V has little or no erosion hazard but has other limitations which are impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover. These limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops; it is nearly level; some occurrences are wet or frequently flooded; others are stony, have climatic limitations, or have some combination of these limitations.
VI	Land in Class VI has severe limitations that make it generally unsuited to cultivation and limit its use largely to pasture and range, woodland or wildlife food and cover; continuing limitations that cannot be corrected include steep slope, severe erosion hazard, effects of past erosion, stoniness, shallow rooting zone, excessive wetness or flooding, low water-holding capacity; salinity or sodicity and severe climate.
VII	Land in Class VII has very severe limitations that make it unsuited to cultivation and that restrict its use largely to grazing, woodland or wildlife; restrictions are more severe than those for Class VI because of one or more continuing limitations that cannot be corrected, such as very steep slopes, erosion, shallow soil, stones, wet soil, salts or sodicity and unfavourable climate.
VIII	Land in Class VIII has limitations that preclude its use for commercial plant production and restrict its use to recreation, wildlife, water supply or aesthetic purposes; limitations that cannot be corrected may result from the effects of one or more of erosion or erosion hazard, severe climate, wet soil, stones, low water-holding capacity, salinity or sodicity.

Table 5.8: Land Capability: Broad Land Use Options

Land capability class	Land use options									Land capability groups
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
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 - Poorly adapted cultivation
MC - Moderately well adapted cultivation
IC - Intensive, well adapted cultivation
VIC - Very intensive, well adapted cultivation

Figure 5.14: Soil Class

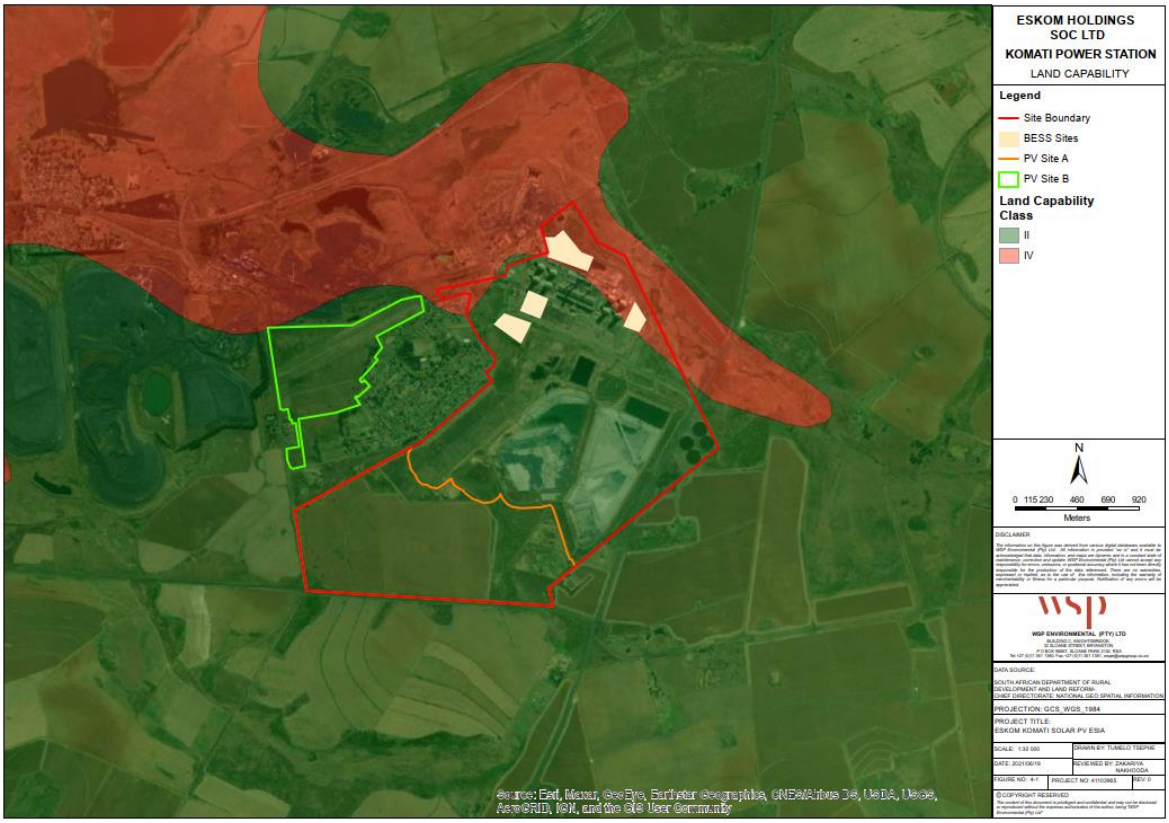


Figure 5.15: Land Capability (Schoeman *et al.*, 2000)

5.2 BIOLOGICAL ENVIRONMENT

5.2.1 TERRESTRIAL BIODIVERSITY

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix G-5****.*

The regional study area is located in the high lying (elevations from 1200 to 1800 m) Highveld ecoregion, which is characterised by plains with a moderate to low relief, as well as various grassland vegetation types. The ecoregion predominantly receives early to late summer rainfall ranging between 400 to 1000 mm per annum. The mean annual temperature is moderate (in the east) and hot (in the west) ranging between 12 to 20°C (Kleynhans, 2005).

The regional study area is situated in a landscape that is characterised by intensive agricultural crop cultivation, numerous coal mines and collieries, rail lines, and the power station itself, interspersed by areas of wetlands and secondary grasslands in valley bottoms where conditions for cultivation are unsuitable.

The study area was defined as follows (**Figure 5.16**):

- Local Study Area (LSA): The proposed development footprint plus all areas encompassed by the Project site boundary, within which direct impacts on biodiversity receptors (i.e. direct habitat loss, fauna mortality) could occur.
- Regional Study Area (RSA) was considered to be the catchment within which the proposed development is situated (**Figure 5.16**) which is considered to be an ecologically appropriate area of analysis for the identification of sensitive biodiversity receptors with potential to occur in the LSA, and within which indirect impacts on biodiversity receptors (e.g., dust deposition, sensory disturbance, hydrological changes) could occur.

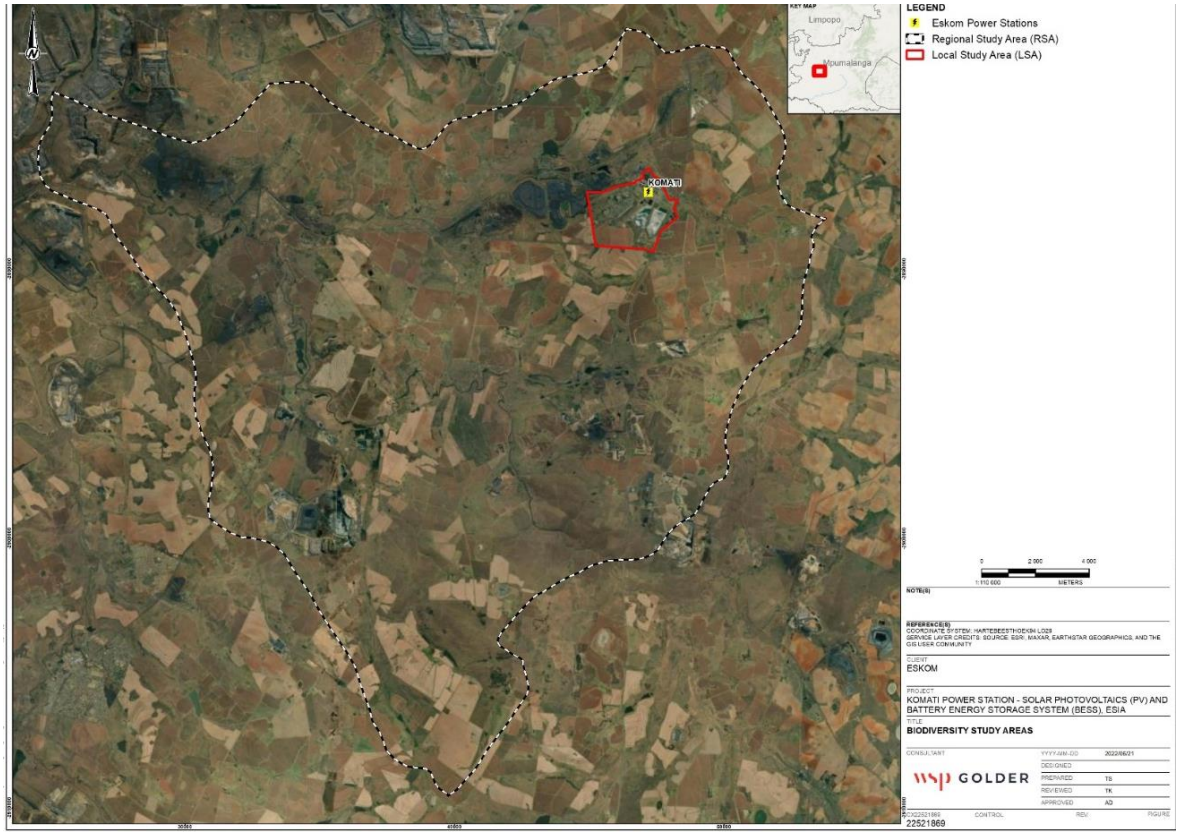


Figure 5.16: Local and regional study areas

ENVIRONMENTAL SCREENING TOOL

The proposed infrastructure footprint was assessed at desktop level using the National Web-based Environmental Screening Tool. According to the Tool, the Terrestrial Biodiversity Theme for the study area is rated 'Very High Sensitivity' due to its overlap with land mapped as 'CBA 2 by the Mpumalanga Biodiversity Sector Plan, 2019 (**Figure 5.17**).

The National Web Based Screening Tool also indicated that remnant wetland areas of the LSA are considered to be of Medium sensitivity due to their support of several plant Species of Conservation Concern (SCC), including *Pachycarpus suaveolens;* and as 'high to very high' sensitivity in terms of the Animal Species Theme due to the potential presence of fauna SCC including Black-footed cat (*Felis nigripes*), Maquassie Shrew (*Crocidura maquassiensis*), African Marsh Rat (*Dasymys robertsii*), Spotted-necked Otter (*Hydrictis maculicollis*), and Oribi (*Ourebia ourebi ourebi*).

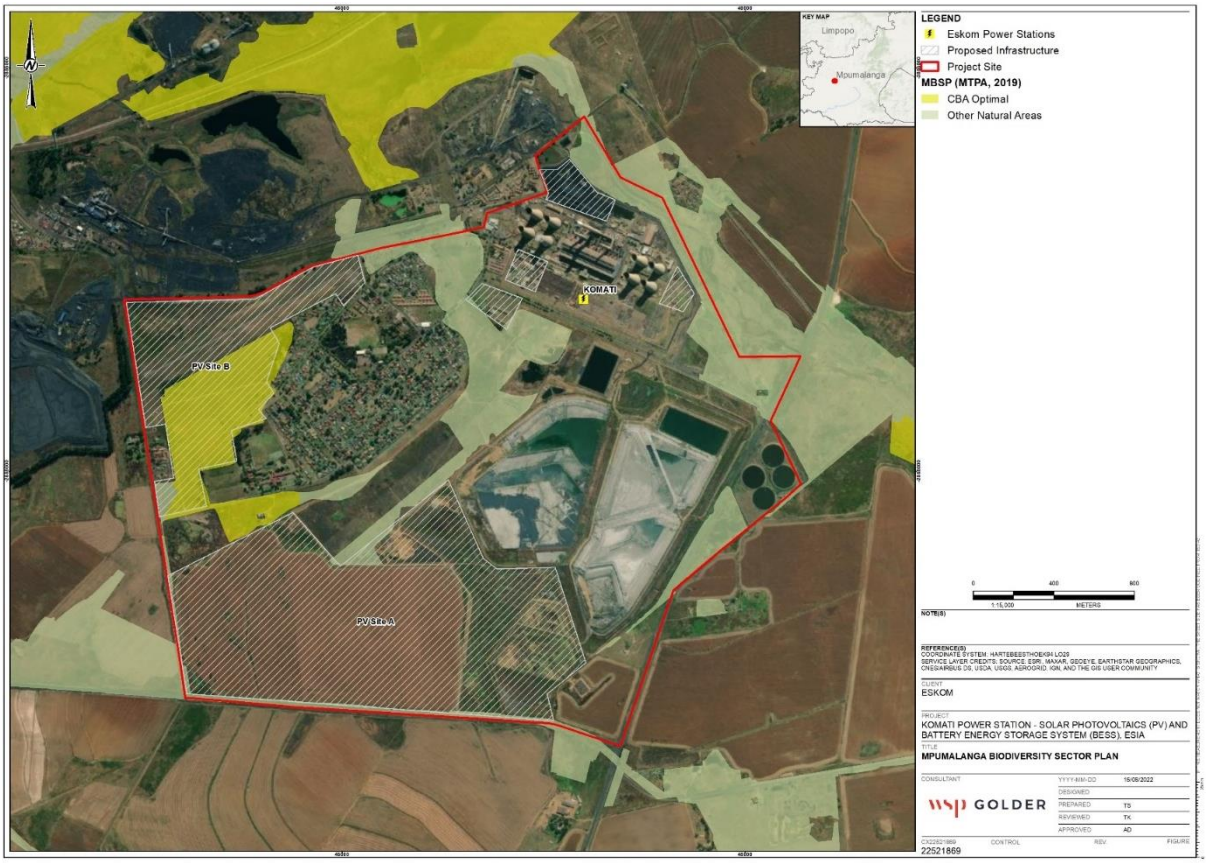


Figure 5.17: Mpumalanga Biodiversity Sector Plan in relation to the proposed development

TERRESTRIAL CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS

The proposed development site was compared to available spatial biodiversity planning datasets in order to assess the local and regional biodiversity context of the site. The following datasets were considered:

- Mpumalanga Biodiversity Sector Plan (MBSP; 2015)

The LSA predominantly falls within areas categorised Heavily or Moderately Modified Areas, whilst Other Natural Areas occur at some of the proposed development site portions. A CBA occurs at the west, largely covering the portion proposed for the establishment of the solar PV Site B (**Figure 5.17**).

CBAs are those areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. These are areas of high biodiversity value and should remain in a natural state that is maintained in good ecological condition (Lötter, 2015). The CBA within which the proposed PV Site B is situated is bordered by the Goedehoop Colliery operations on the north and west, and a residential area on the east and farmlands on the south, all of which encompass Heavily or Moderately Modified Areas. Thus the level of anthropogenic disturbance renders the CBA unlikely to meet biodiversity targets for species and ecosystems and ecological processes.

PRIORITY AREAS FOR PROTECTED AREA EXPANSION

None of the proposed infrastructure coincides with areas that have been identified as Priority Focus Areas as part of the NPAES (2016) (**Figure 5.18**).

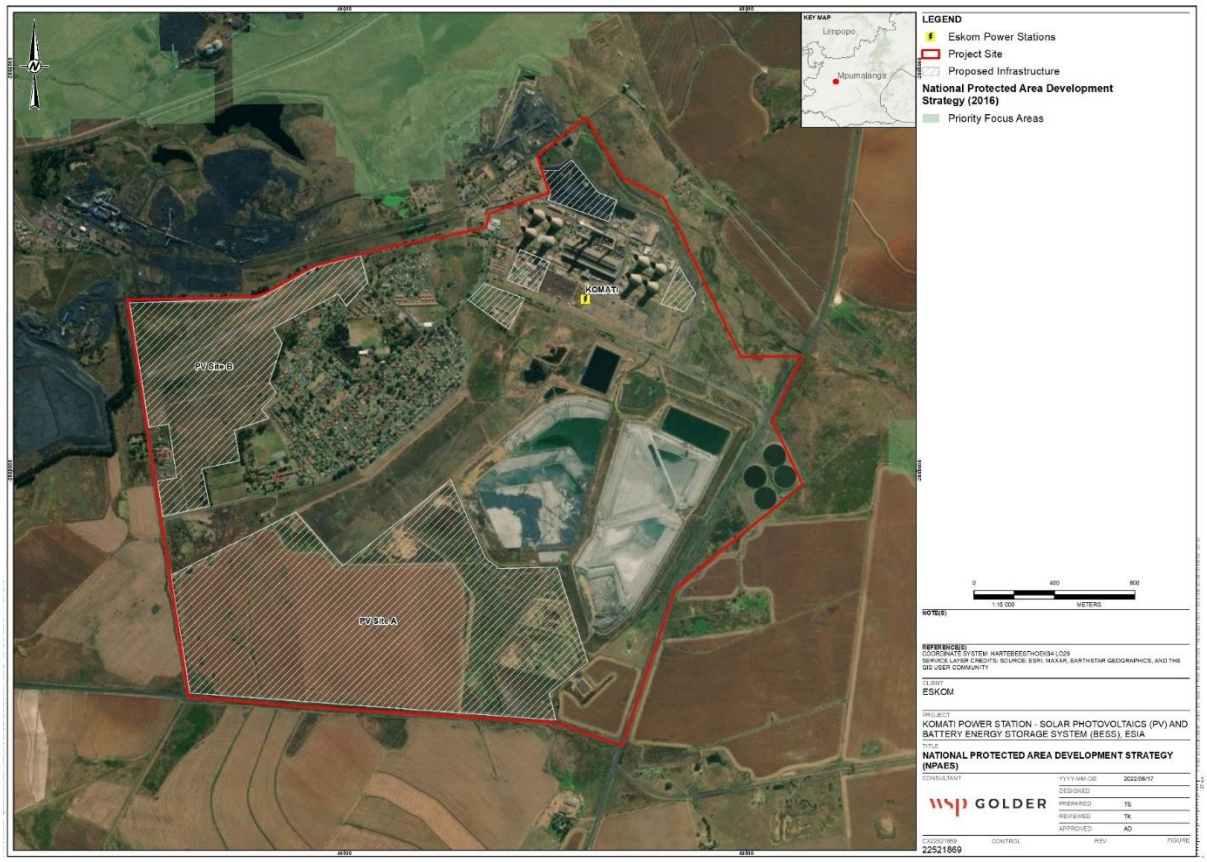


Figure 5.18: Priority Areas for Protected Area Expansion in relation to the proposed development

PROTECTED AREAS

No Protected Areas, Important Bird Areas (IBAs) nor Key Biodiversity Areas (KBAs) occur within the proposed development site (Lötter, 2015; BirdLife International (2022). The nearest IBA is Amersfoort - Bethal - Carolina District which is situated approximately 15 km southeast of the LSA.

INDIGENOUS FORESTS

No indigenous forest habitat occurs within the study area, which is characterised by currently/previously cultivated areas, disturbed grounds, secondary grassland (e.g. at the airstrip) and the existing power station infrastructure.

EXISTING IMPACTS ON BIODIVERSITY AND DRIVERS OF CHANGE

The proposed project infrastructure will be situated near the existing power generation facilities and activities. All areas visited are currently experiencing some level of impact from the surrounding agricultural activities primarily through habitat transformation, and disturbance arising from power generation facilities and activities.

The presence of the existing power station facilities within close proximity to the proposed development footprint is expected to have an established impact on faunal species that are susceptible to sensory disturbance, particularly mammals and bird species which would actively avoid areas of high mechanical/human disturbance. Site lighting at night is also considered to be a likely factor in deterrence of these fauna from utilising the proposed development footprint for foraging/roosting purposes, and may also be driving changes in localised invertebrate distribution patterns, with certain species (and their predators e.g. bats) likely to be attracted to site security lighting at night, whilst others are deterred by it.

NATURAL, MODIFIED AND CRITICAL HABITATS

The WB's ESS 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources (World Bank, 2016) separates habitat into four categories for the purposes of implementing a differentiated risk

management approach to habitats based on their sensitivity and values. The categories include 'Modified habitat', 'Natural habitat', 'Critical Habitat' and 'Legally protected and internationally and regionally recognized areas of biodiversity value'; each of which have varying levels of Borrower obligation in terms of biodiversity mitigation and management, and offset requirements.

Whilst the assessment of Modified and Natural habitats is largely based on the establishment of the ecological condition of mapped habitat/vegetation units, and the boundaries of legally protected and/or internationally recognised areas of high biodiversity value are generally defined; the identification and assessment of Critical Habitat requires additional, focussed effort – usually focussed on the presence of Critically Endangered, Endangered, range-restricted or migratory/congregatory species in significant numbers.

The study area is dominated by agricultural cultivation, power station infrastructure and residential/industrial areas, interspersed with some remnant wetland habitat. While some very disturbed wetland habitat has been identified in the eastern extent of PV Site A, it is no longer considered to constitute 'Natural' habitat as defined by WB ESS 6, due to its heavily degraded state and loss of ecological function. The channelled valley bottom wetland to the north east of the site, and the seep wetland that crosses the northern boundary of the site, while moderately modified/disturbed, still support biodiversity and deliver ecological services to an extent that enables them both to be considered 'Natural' habitat (**Figure 5.19**) as defined by the lender standards. This "Natural" habitat does not support any Critically Endangered, Endangered, range-restricted or migratory/congregatory species in significant numbers.

At present, no areas of potentially Critical habitat, as defined by WB ESS 6, have been identified within the study area.

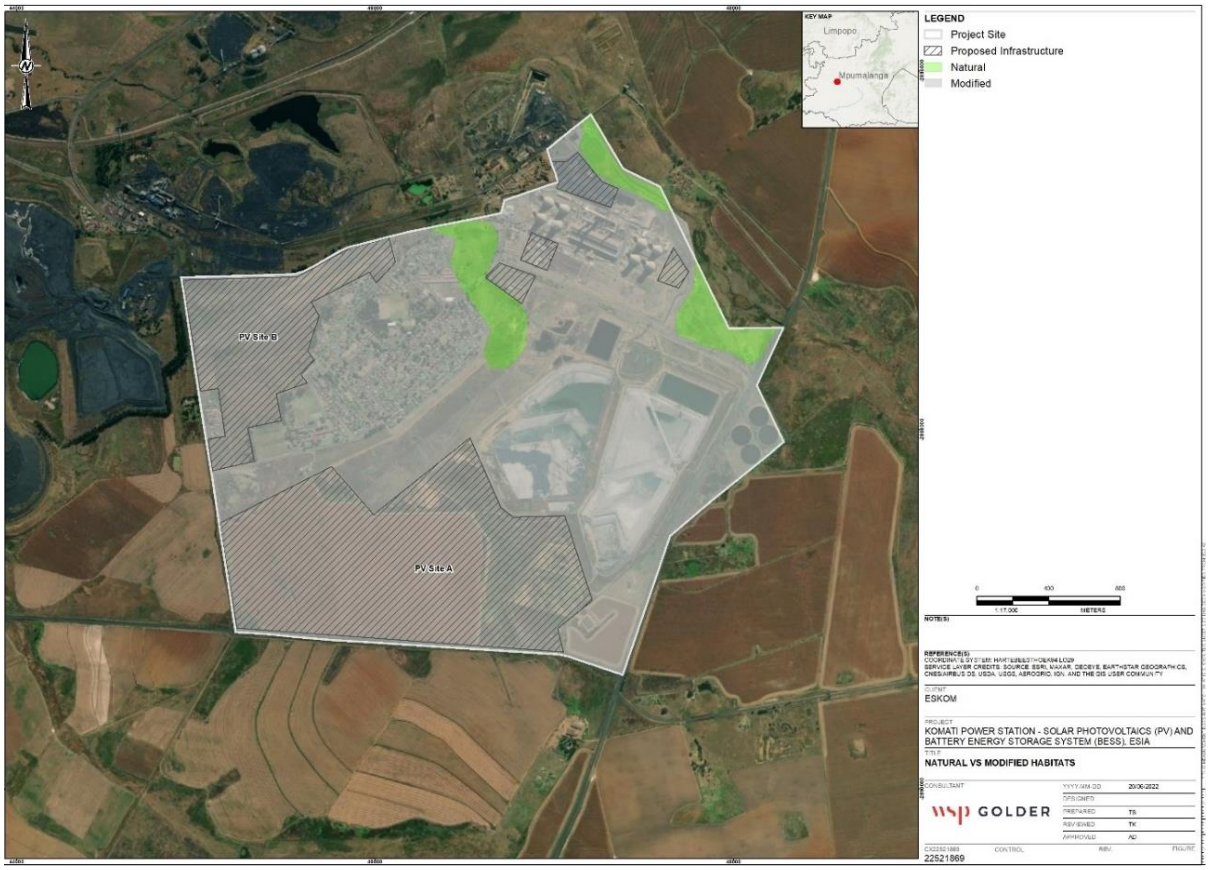


Figure 5.19: Natural, modified and critical habitat

5.2.2 TERRESTRIAL VEGETATION

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix G-5****.*

VEGETATION TYPES

The site is situated within a single vegetation type, Eastern Highveld Grassland (Gm12) (**Figure 5.20**), remnant patches of which may occur in non-transformed areas of the project site.

The Eastern Highveld Grassland spans across approximately 1,2 million hectares in the Mpumalanga Province. This is a poorly protected vegetation type with only about 35% remaining natural (Lötter M.c., 2014). According to Mucina & Rutherford (2006), the Eastern Highveld Grassland (Gm 12) vegetation unit is dominated by the usual highveld grass composition, including species such as *Aristida aequiglumis, A. congesta; Digitaria monodactyla, D. tricholaenoides; Eragrostis chloromelas, E. curvula, E. plana. E. racemosa; Themeda triandra; Tristachya leucothrix,* and *T. rehmanii*, with small scattered rocky outcrops with wiry, sour grasses and some woody species.

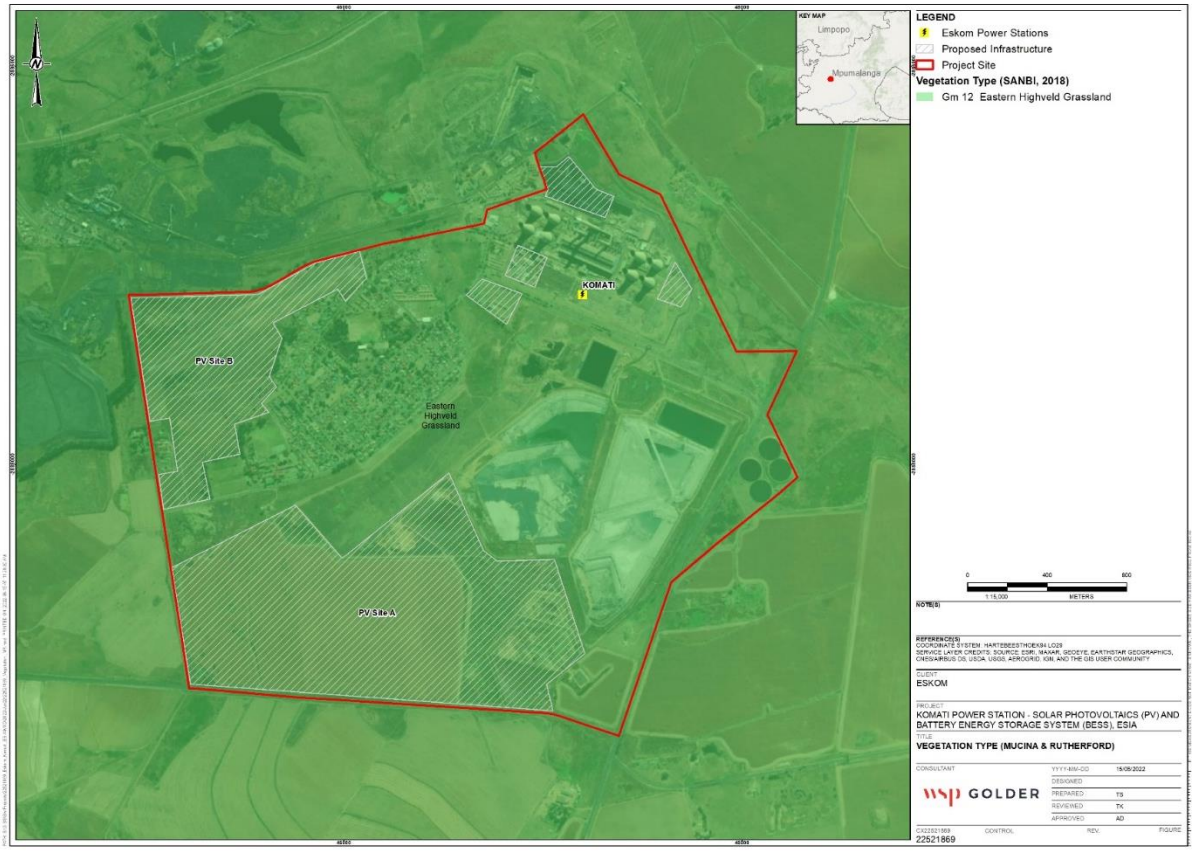


Figure 5.20: Proposed development in relation to Mucina & Rutherford vegetation types

NEMBA THREATENED ECOSYSTEMS

Eastern Highveld Grassland is considered to be Vulnerable nationally (**Figure 5.21**) (Government notice 1002/2011, in terms of section 52(1)(a) of NEMBA)), as only a very small fraction is conserved in statutory reserves (Nooitgedacht Dam and Jericho Dam Nature Reserves) and approximately 44% has been transformed, primarily by cultivation, plantations, mines, urbanisation and the building of dams.

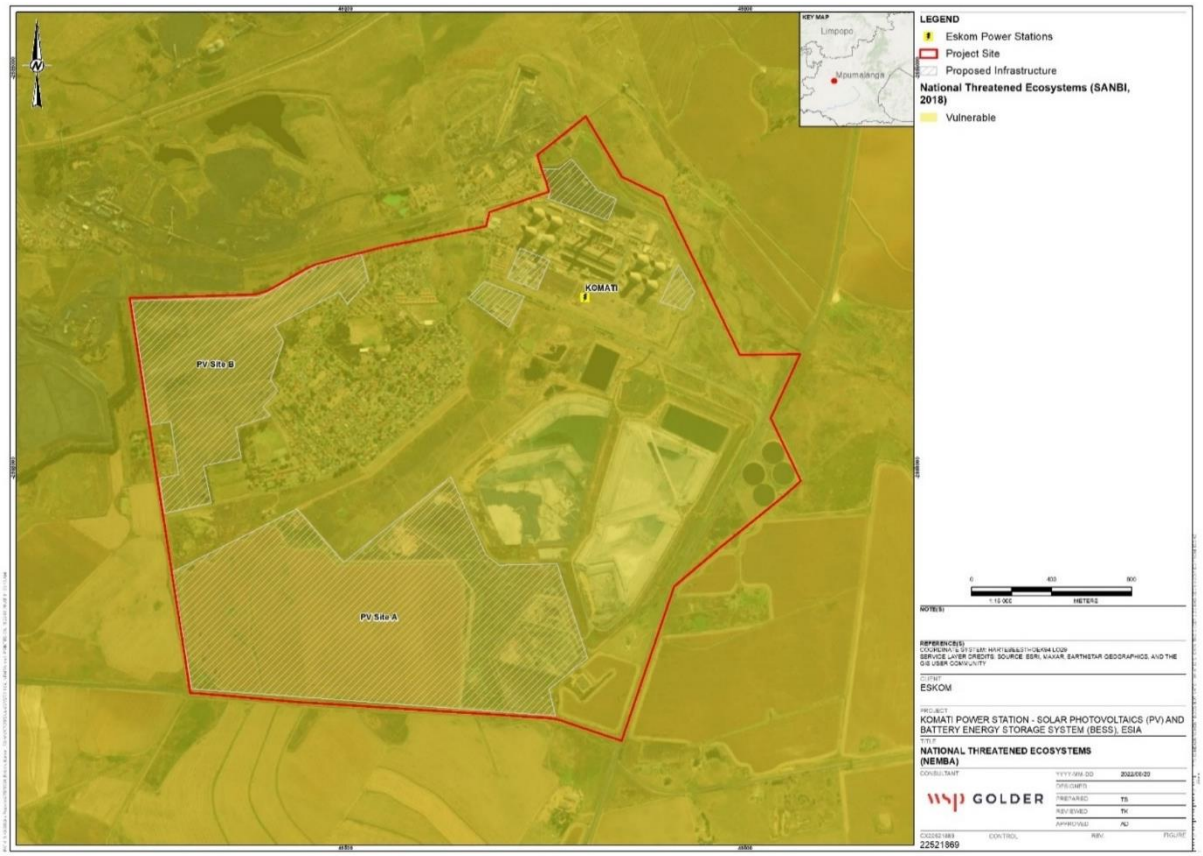


Figure 5.21: Proposed development in relation to the National Threatened Ecosystems (SANBI, 2018)

FLORA SPECIES OF CONSERVATION CONCERN

A list of flora SCC which occur within the region are provided in **Table 5.9**. Eight of the species are nationally red-listed with classifications ranging between Near Threatened to Rare. The species *Eucomis montana* and *Eucomius autumnalis* are protected under the Mpumalanga Nature Conservation Act No. 10 of 1998.

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ (or the IUCN Red List) is the world's most comprehensive information source on the global conservation status of plant, animal and fungi species. It is based on an objective system for assessing the risk of extinction of a species should no conservation action be taken.

Species are assigned to one of eight categories of threat based on whether they meet criteria linked to population trend, population size and structure and geographic range. Species listed as Critically Endangered, Endangered or Vulnerable are collectively described as 'Threatened'.

The IUCN Red List of Threatened Species website (https://www.iucnredlist.org/) was consulted to determine if any of the confirmed / expected SCC in the region (**Table 5.9**) appeared on the IUCN Red List of Threatened Species. None of the identified SCC appeared on the IUCN Red List of Threatened Species.

It must be noted that RSA Red Lists are used because they are more specific and applicable to a particular species' local status and considers threat level and conservation efforts within the country. The IUCN system allows for assessments of geographical subsections of a species' global range (i.e. regional assessments) – subsections are human-defined boundaries, such as a country of provincial border. In line with this, South Africa uses the internationally endorsed IUCN Red List Categories and Criteria to develop their own national/regional flora and fauna Red Lists. If a species is endemic to South Africa, then the regional Red List status and the global IUCN status will be the same. If a species is not endemic, then the regional and global Red Lists statuses may differ. However, owing to the difference in geographic scale of the assessments, regional Red Lists statuses are always higher than global statuses. I.e., a species is likely to be considered more threatened at a regionals scale than global. A conservative approach that is beneficial to biodiversity conservation.

Table 5.9: Confirmed/expected SCC in the region

SCIENTIFIC NAME	RSA RED LIST STATUS	MPUMALANGA PROTECTED / THREATENED SPECIES	IUCN 2022-1
Anacampseros subnuda subsp. lubbersii	Vulnerable	–	–
Callilepis leptophylla	Least Concern	✓	–
Eucomis montana	Least Concern	✓	–
Eucomius autumnalis	Least Concern	✓	–
Frithia humilis	Vulnerable	–	–
Gladiolus paludosus	Vulnerable	–	–
Ilex mitis var. mitis	Least Concern	✓	–
Jamesbrittenia macrantha	Near Threatened	–	–
Khadia alticola	Rare	–	–
Khadia carolinensis	Vulnerable	–	–
Miraglossum davyi	Vulnerable	–	–
Pachycarpus suaveolens	–	✓	–
Streptocarpus denticulatus	Vulnerable	–	–

5.2.3 FAUNA

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix G-5****.*

According to the Mpumalanga Biodiversity Sector Plan Handbook (2014), the province hosts a relatively high faunal diversity with approximately 173 mammal, 575 bird, 171 reptile, 51 amphibian and 62 fish species. This high species richness is attributed to the wide variety of habitats within the savanna, forest and grassland biomes. However, the project area is expected to host a low species diversity due to current and historic agriculture and mining/power-generation land uses resulting in the largely disturbed nature of the area.

MAMMALS

Although no mammal species were directly observed within the LSA during an EIA undertaken for the Komati Power Station in 2008 (Synergistics Environmental Services, 2008), signs of Common Reedbuck (*Redunca redunca*), Grey Duiker (*Sylvicapra grimmia*) and Porcupine (*Hystrix africaeaustralis*) were observed. Data obtained from the Animal Demographic Unit (ADU) Virtual Museum show that six species have been photographed within the grid coordinates (Quarter Degree Square (QDS)) of interest (i.e. 2629AB and the neighbouring 2629BA; **Table 5.10**).

The IUCN Red List of Threatened Species website (https://www.iucnredlist.org/) was consulted to determine if any of the confirmed / expected mammal species (**Table 5.10**) appeared on the IUCN Red List of Threatened Species. Eight of the confirmed/expected mammal species appeared on the list, however only one has been classified as Vulnerable (Black-footed cat) and Near Threatened (Spotted-necked Otter).

Table 5.10: Confirmed/expected mammal species within the 2629AB and 2629BA QDS (Synergistics Environmental Services, 2008; Animal Demographic Unit Virtual Museum, 2022)

COMMON NAME	SCIENTIFIC NAME	RSA RED LIST STATUS	MPUMALANGA PROTECTED SPECIES	IUCN 2022-1
African Marsh Rat	*Dasymys robertsii*	Vulnerable	–	Least Concern
Black-footed cat	*Felis nigripes*	Vulnerable	–	Vulnerable
Blesbok	*Damaliscus pygargus phillipsi*	Least Concern	–	–
Common Genet	*Genetta genetta*	Least Concern	–	Least Concern
Maquassie Shrew	*Crocidura maquassiensis*	Vulnerable	–	Least Concern
Oribi	*Ourebia ourebi ourebi*	Vulnerable	Protected	–
Serval	*Leptailurus serval*	Near Threatened	–	Least Concern
Southern African Hedgehog	*Atelerix frontalis*	Near Threatened	Protected	Least Concern
Spotted-necked Otter	*Hydrictis maculicollis*	Vulnerable	Protected	Near Threatened
Xeric Four-striped Grass Rat	*Rhabdomys pumilio*	Least Concern	–	Least Concern

MAMMAL SPECIES OF CONSERVATION CONCERN

Three of the ten species that have been confirmed or expected within the 2629AB and 2629BA are classified as Least Concern. Although the national screening tool indicates the potential presence of the provincially protected species including Black-footed cat, Oribi and the Spotted-necked Otter, these are not considered likely to be present due to the transformed nature of the habitats within the study area. There is a potential for Maquassie Shrew and/or African Marsh Rat to occur in remnant wetland habitats, however the presence of African Marsh Rat is considered unlikely since African Marsh Rats are dependent on intact rivers and wetland ecosystems and have not been found in artificial or degraded wetlands (Pillay, 2016); whilst the transformed nature of much of the study area limits its suitability for the rare Maquassie Shrew.

BIRDS

A total of 115 bird species have been confirmed or are expected to occur within the 2605_2925 coverage based on the data retrieved from the South African Bird Atlas Project 2 (SABAP2; 2022), of these species, 29 were classified as species of conservation concern (**Table 5.11**). Only two of these species are red listed at the national level; the Saddle-billed Stork (*Ephippiorhynchus senegalensis*) which is listed as Endangered and the Secretary bird (*Sagittarius serpentarius*) listed as Vulnerable.

The IUCN Red List of Threatened Species website (https://www.iucnredlist.org/) was consulted to determine if any of the confirmed / expected bird species (**Table 5.11**) appeared on the IUCN Red List of Threatened Species. Only one has been classified as Vulnerable (Secretary bird).

Table 5.11: Confirmed/expected bird species within the 2629AB QDS (Animal Demographic Unit Virtual Museum, 2022)

COMMON NAME	SCIENTIFIC NAME	SA NATIONAL REDLIST STATUS (2016)	MPUMALANGA PROTECTED SPECIES	IUCN 2022-1
Common Sandpiper	*Actitis hypoleucos*	–	Protected	Least Concern
Egyptian Goose	*Alopochen aegyptiaca*	–	Protected	Least Concern
African Pipit	*Anthus cinnamomeus*	–	Protected	Least Concern
Common Buzzard	*Buteo buteo*	–	Protected	Least Concern
Little Stint	*Calidris minuta*	–	Protected	Least Concern
Ruff	*Calidris pugnax*	–	Protected	Least Concern
Common Ringed Plover	*Charadrius hiaticula*	–	Protected	Least Concern
Kittlitz's Plover	*Charadrius pecuarius*	–	Protected	Least Concern
Three-banded Plover	*Charadrius tricollaris*	–	Protected	Least Concern
Saddle-billed Stork	*Ephippiorhynchus senegalensis*	Endangered	Protected	Least Concern
African Snipe	*Gallinago nigripennis*	–	Protected	Least Concern
Black-winged Stilt	*Himantopus himantopus*	–	Protected	Least Concern
Barn Swallow	*Hirundo rustica*	–	Protected	Least Concern
Little Bittern	*Ixobrychus minutus*	–	Protected	Least Concern

COMMON NAME	SCIENTIFIC NAME	SA NATIONAL REDLIST STATUS (2016)	MPUMALANGA PROTECTED SPECIES	IUCN 2022-1
Cape Wagtail	*Motacilla capensis*	–	Protected	Least Concern
Capped Wheatear	*Oenanthe pileata*	–	Protected	Least Concern
African Spoonbill	*Platalea alba*	–	Protected	Least Concern
Glossy Ibis	*Plegadis falcinellus*	–	Protected	Least Concern
African Swamphen	*Porphyrio madagascariensis*	–	Protected	Least Concern
Tawny-flanked Prinia	*Prinia subflava*	–	Protected	Least Concern
Secretary bird	*Sagittarius serpentarius*	Vulnerable	Protected	Vulnerable
African Stonechat	*Saxicola torquatus*	–	Protected	Least Concern
African Sacred Ibis	*Threskiornis aethiopicus*	–	Protected	Least Concern
Wood Sandpiper	*Tringa glareola*	–	Protected	Least Concern
Common Greenshank	*Tringa nebularia*	–	Protected	Least Concern
Marsh Sandpiper	*Tringa stagnatilis*	–	Protected	Least Concern
Blacksmith Lapwing	*Vanellus armatus*	–	Protected	Least Concern
Crowned Lapwing	*Vanellus coronatus*	–	Protected	Least Concern
African Wattled Lapwing	*Vanellus senegallus*	–	Protected	Least Concern

The national screening tool report for the site also indicates that three additional bird species are considered likely to occur; African Grass Owl (*Tyto capensis*), Caspian tern (*Hydroprogne caspia*) and White-bellied Bustard (*Eupodotis senegalensis)*. During the avifauna site visit conducted on 17 June 2022, habitats with potential to support African Grass Owl were mapped (**Figure 5.22**), since this species has the greatest likelihood of being affected by the proposed Project, should this species be present (breeding) in the LSA. Comprehensive surveys to confirm the presence of any significant populations of bird SCC within the LSA will be conducted later in 2022.

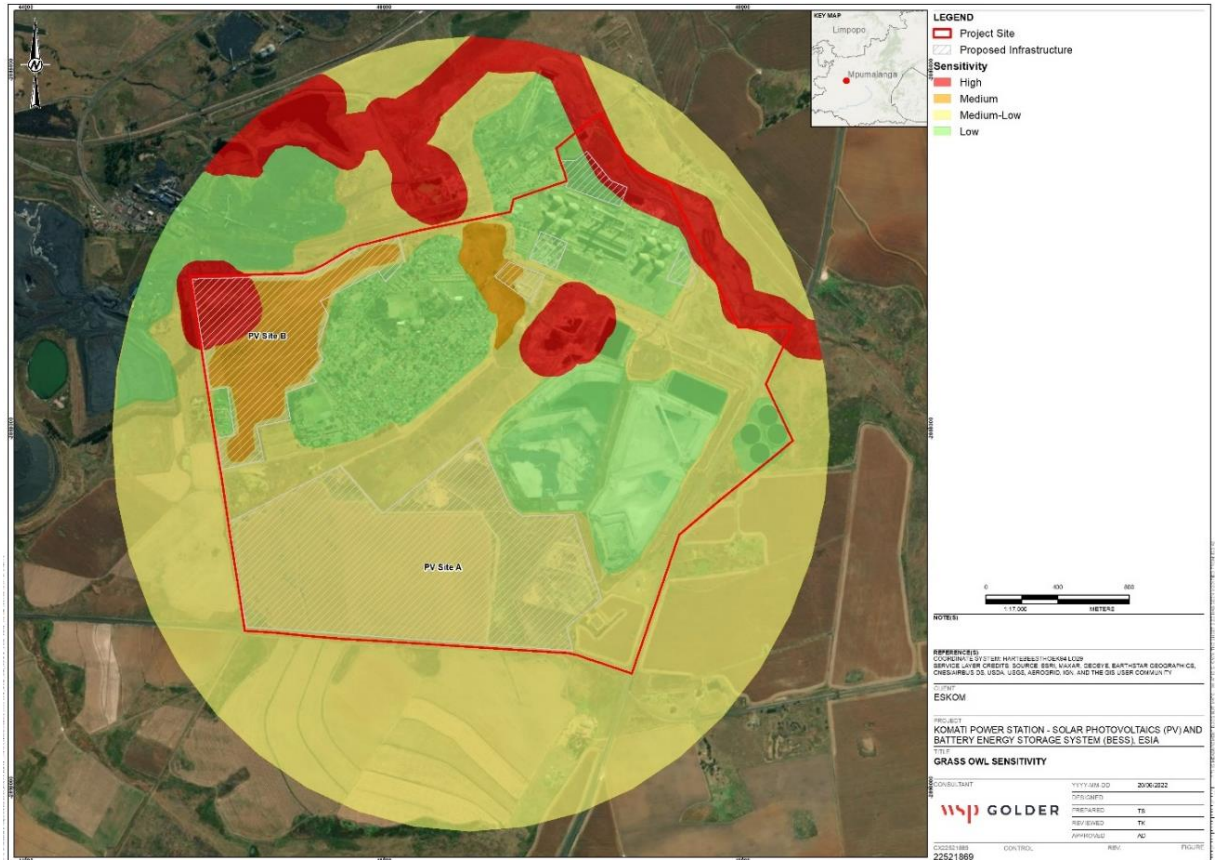


Figure 5.22: Grass owl sensitivity map

HERPETOFAUNA

Data retrieved from the ADU Virtual Museum indicate the occurrence of three frog species within the 2629BA QDS, no records of amphibians are held for the 2629AB QDS (**Table 5.12**). None of the frog species are considered SC. Ten reptile species were recorded from both 2629BA and 2629AB QDSs (**Table 5.13**). All herpetofauna species were classified as Least Concern. No herpetofauna SCC were flagged for the study area by the national screening tool.

The IUCN Red List of Threatened Species website (https://www.iucnredlist.org/) was consulted to determine if any of the previous confirmed frog species (**Table 5.12**) and reptile species (**Table 5.13**) appeared on the IUCN Red List of Threatened Species. Although all confirmed frog and reptile species appear on the list, they are classified as Least Concern.

Table 5.12: Previously confirmed frog species within the 2629BA QDS (Animal Demographic Unit Virtual Museum, 2022)

COMMON NAME	SCIENTIFIC NAME	RSA RED LIST STATUS	IUCN 2022-1
Guttural Toad	Sclerophrys gutturalis	Least Concern	Least Concern
Common Platanna	*Xenopus laevis*	Least Concern	Least Concern
Delalande's River Frog	*Amietia delalandii*	Least Concern	Least Concern

Table 5.13: Previously confirmed Reptile species within the 2629AB and 2629BA QDS (Animal Demographic Unit Virtual Museum, 2022)

COMMON NAME	SCIENTIFIC NAME	RSA RED LIST STATUS	MPUMALANGA PROTECTED SPECIES	IUCN 2022-1
Bibron's Blind Snake	*Afrotyphlops bibronii*	Least Concern	–	Least Concern
Black-headed Centipede-eater	*Aparallactus capensis*	Least Concern	–	Least Concern
Cape Skink	*Trachylepis capensis*	Least Concern	Protected	Least Concern
Mole Snake	*Pseudaspis cana*	Least Concern	–	Least Concern
Red-lipped Snake	*Crotaphopeltis hotamboeia*	Least Concern	–	Least Concern
Rhombic Egg-eater	*Dasypeltis scabra*	Least Concern	–	Least Concern
Rinkhals	*Hemachatus haemachatus*	Least Concern	–	Least Concern
Speckled Rock Skink	*Trachylepis punctatissima*	Least Concern	Protected	Least Concern
Spotted Grass Snake	*Psammophylax rhombeatus*	Least Concern	–	Least Concern
Transvaal Gecko	*Pachydactylus affinis*	Least Concern	Protected	Least Concern

5.2.4 AQUATIC BIODIVERSITY

*The following is extracted from the Aquatic Biodiversity compiled by WSP and included as **Appendix G-9**.*

The study area for the Aquatic Specialist Assessment was defined at two levels:

- LSA: The proposed development footprint plus a 500 m buffer, so that the project interaction with any watercourses and their 'regulated zone' as defined by the National Water Act can be identified, since this is the area within which direct impacts on biodiversity receptors (i.e. wetlands / aquatic ecosystems) could occur (**Figure 5.23**);
- RSA: The catchment within which the proposed development is situated, which is considered to be an ecologically appropriate area of analysis within which indirect impacts on aquatic receptors (e.g. downstream water quality deterioration, alteration of sub-catchment hydrology, soil erosion, hydrological changes) could occur (**Figure 5.24**).

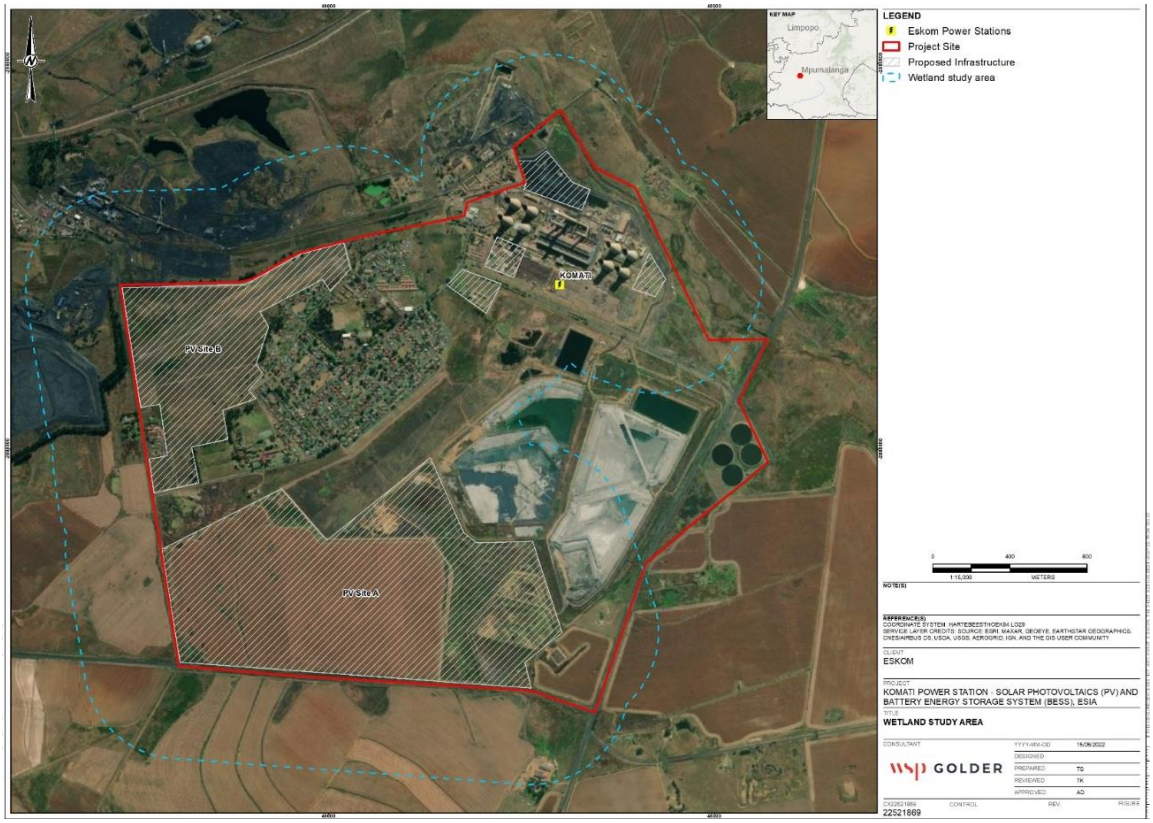


Figure 5.23: Aquatic biodiversity local study area

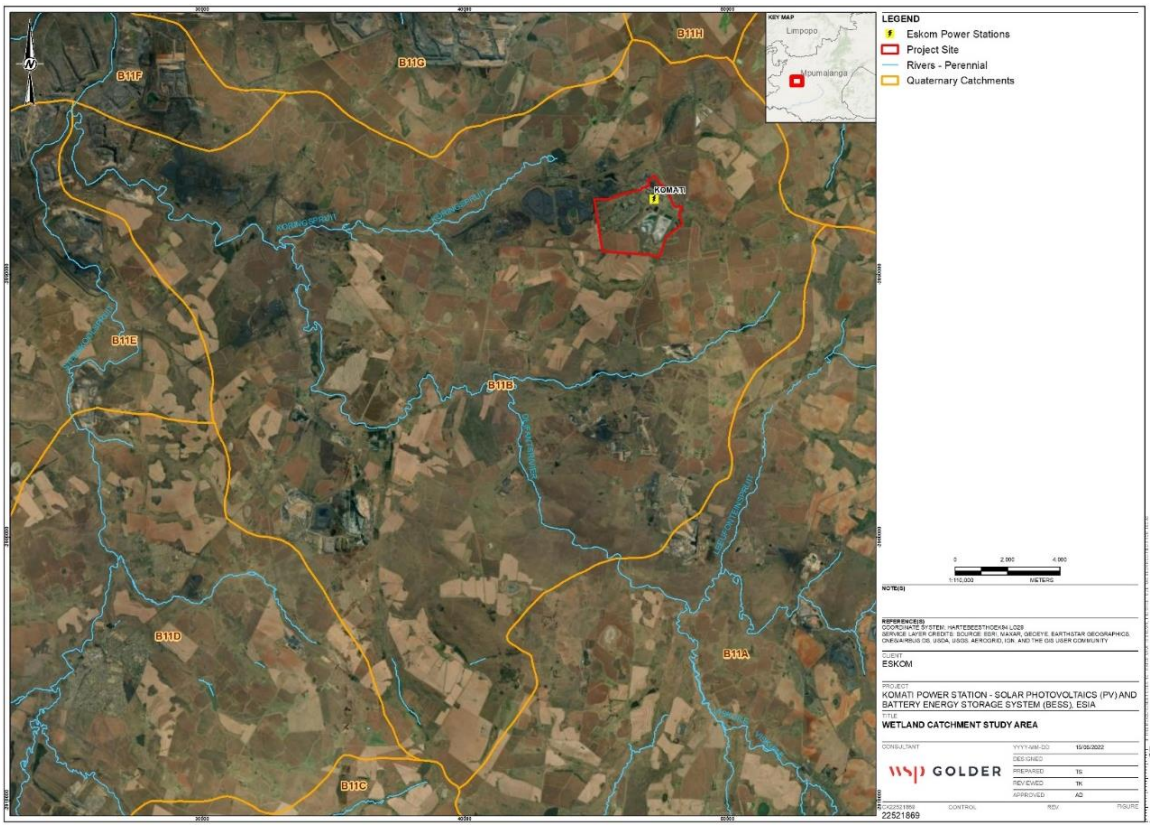


Figure 5.24: Aquatic biodiversity regional study area as defined by the quaternary catchment B11B

ENVIRONMENTAL SCREENING TOOL

The proposed infrastructure footprint was assessed at desktop level using the National Web-based Environmental Screening Tool. According to the Tool, the Aquatic Biodiversity Theme for the study area is rated 'High Sensitivity' due to the presence of wetlands features in and around the study area (**Figure 5.25**). Since the watercourses in the study area are wetland systems, no assessment of macroinvertebrates or fish is included in the baseline description.

Figure 5.25: Map of relative Aquatic Biodiversity Theme Sensitivity (Environmental Screening Tool, 2022)

FRESHWATER CBAS AND ESAS

The proposed development site was compared to available relevant spatial biodiversity planning datasets in order to assess the local and regional biodiversity context of the site. The following datasets were considered:

- MBSP Freshwater Assessment (2011).

The MBSP (2011) freshwater assessment spatial dataset includes various areas mapped as 'other natural areas' throughout the local study area (**Figure 5.26**), as well as part of the channelled valley bottom wetland associated with the Koringspruit which was classified as 'ESA: wetland'.

It is important to note that the MPSBP freshwater assessment was based largely on remotely sensed imagery, and thus some wetlands are not included (e.g. historic wetlands lost through drainage or ploughing); similarly, some features have been mapped as wetlands, which, once examined in the field, are not defined as wetlands. The most up-to-date spatial dataset at the national level is now considered to be the National Wetland Map 5, which displays a more accurate representation of actual wetland conditions on site.

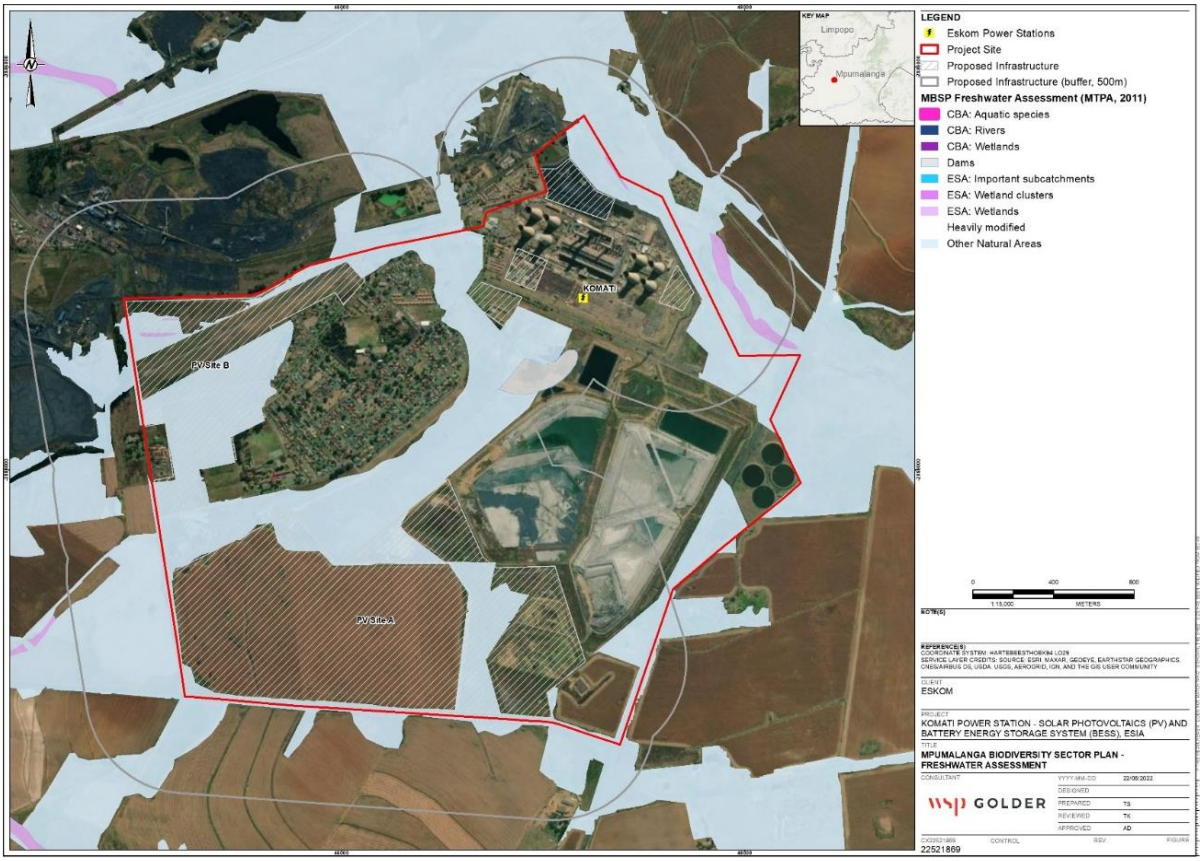


Figure 5.26: MBSP Freshwater Assessment (MTPA, 2011)

STRATEGIC WATER SOURCE AREAS

No strategic water source areas occur in the region of the proposed development footprint; as such these are not included as receptors for the current impact assessment or considered further here.

FRESHWATER ECOSYSTEM PRIORITY AREA (FEPA) SUB-CATCHMENTS

The proposed development footprint in relation to FEPA sub-catchments and mapped National Freshwater Ecosystem Priority Areas (NFEPA) wetlands is illustrated on **Figure 5.27** and **Figure 5.28** respectively. As mentioned above, the National Wetland Map version 5 (NWM5) (Van Deventer et al., 2019), is the most up-to-date and accurate representation of spatial extent and type of inland wetland ecosystem types at desktop level in South Africa. The NWM5 dataset indicates the presence of channelled valley bottom and seep wetland habitat within the LSA (**Figure 5.29**); these systems were prioritised for confirmation of delineation, and assessment of wetland health and ecological importance, during the wetland field survey.

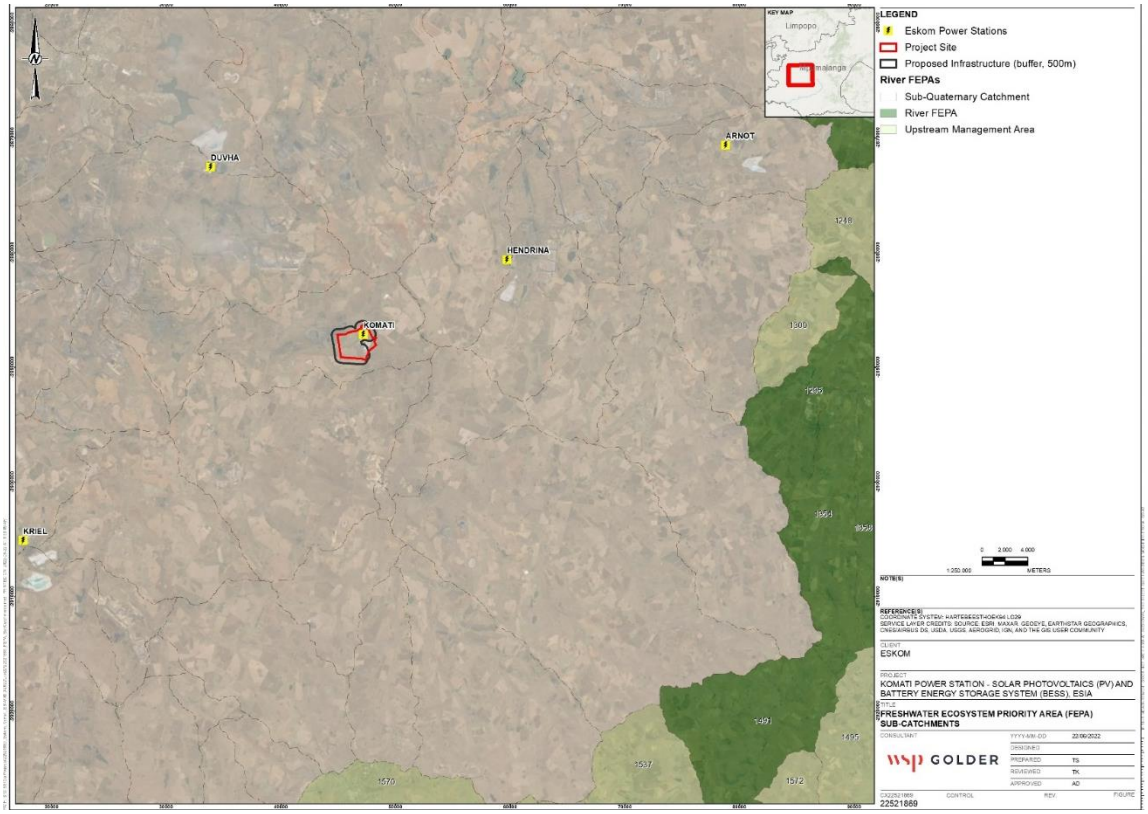


Figure 5.27: Study area in relation to FEPA sub-catchments

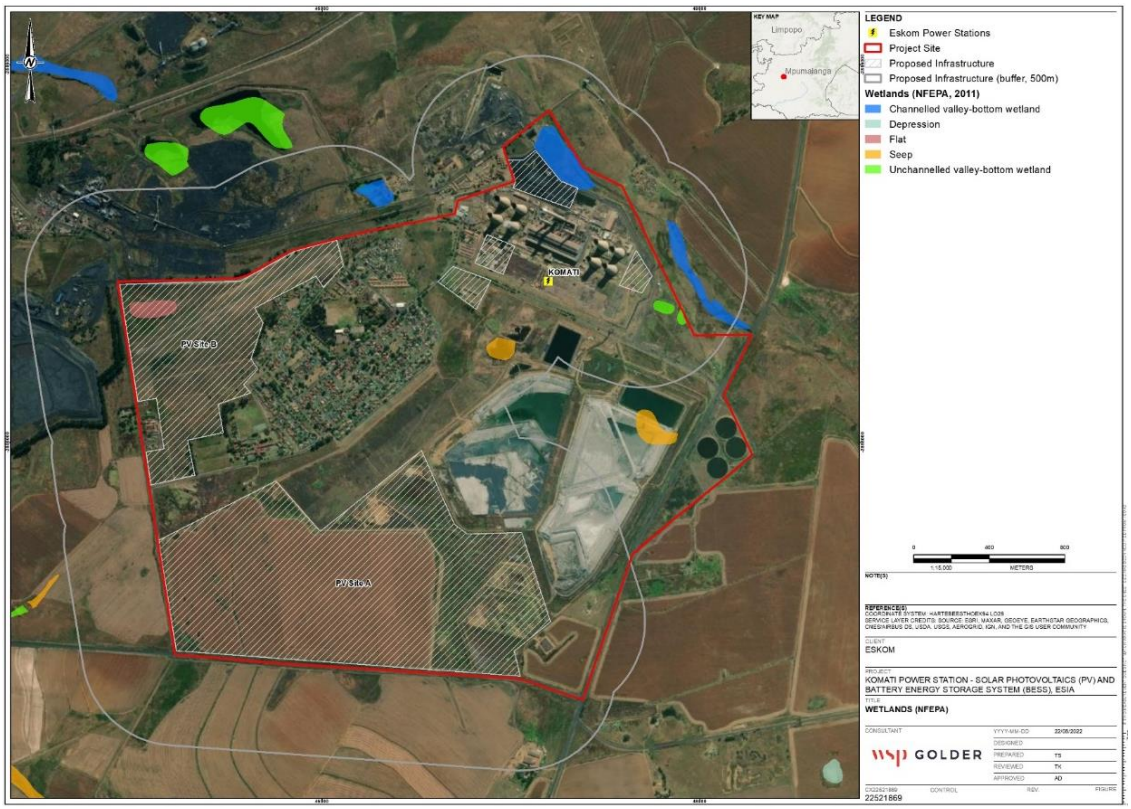


Figure 5.28: Proposed development in relation to NFEPA wetlands (2011)

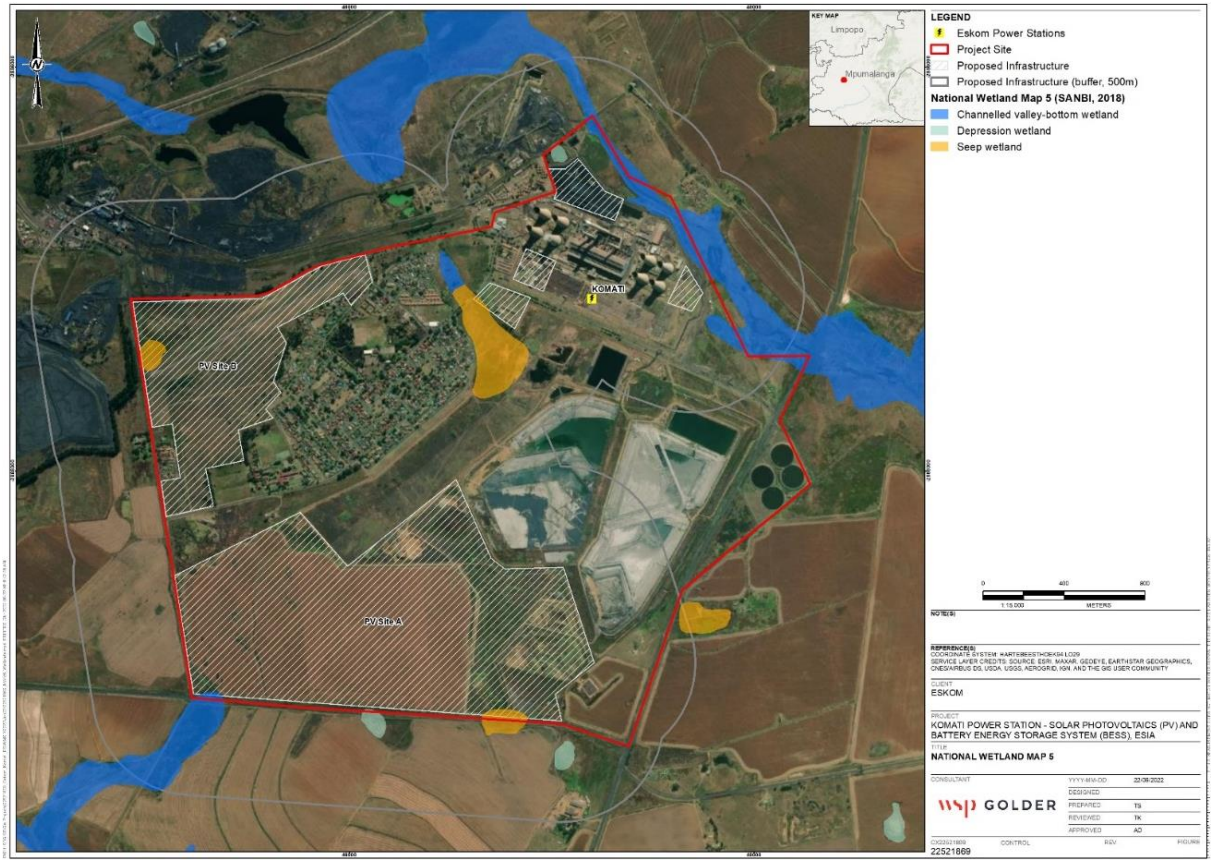


Figure 5.29: Proposed development in relation to NWM5 wetlands (2019)

WETLANDS DELINEATION AND CLASSIFICATION

Four wetlands have been identified to occur within a 500m of the proposed Project development (**Figure 5.35**). The infield sampling of soil and vegetation in conjunction with the recording of diagnostic topographical /terrain indicators and features, enabled the delineation of the following distinct watercourse units:

- A Channelled valley bottom wetland (CVB),
- Two isolated seepage wetlands (Seep 1 and Seep 2), and
- Depression wetland

Several areas of highly disturbed grassland were also identified within the study area. Excavations and earthworks in these areas have resulted in high levels of disturbance of the soil profile, with some ephemeral accumulation of water during periods of high rainfall enabling *Imperata cyclindrica* (which although it occurs in wetlands, is not a reliable wetland indicator, since it can proliferate in disturbed terrestrial areas with high rainfall) to proliferate; however water is not retained in these disturbed soils for long enough to sustain hydrophytic plant species, or soil form indicators to develop. These areas were therefore not classified as wetland habitat.

CHANNELLED VALLEY BOTTOM WETLAND

A channelled valley bottom wetland associated with the Koringspruit occurs within the study area (**Figure 5.30** - **Figure 5.32**). CVB wetlands are characterised by having a well-defined stream channel but lacking characteristic floodplain features, which was the case for the CVB wetland on site. These systems receive water inputs from the main channel and from adjacent slopes (Kotze et al., 2008). The CVB wetland was dominated by permanent and seasonal wetland plant species including *Typha capensis*, *Phragmites australis*, *Schoenoplectus paludicola*, and *Cyperus latifolius* as well as hygrophilous grassland community such as *Eragrostis rotifer*. The wetland was also characterised by temporary and seasonal hydromorphic soil characteristics (**Figure 5.31**), indicating brown wetland soils.

The wetland is highly impacted and appears to receive effluent discharge from the Power Station. The wetland channel shows signs of extensive flows during large storm events and also lateral inputs from surrounding land uses. The CVB is situated adjacent to the proposed BESS footprint.

Figure 5.30: An overview of the Channelled valley Bottom wetland (upstream and downstream)

Figure 5.31: Soil Sample taken at 50-60 cm in the seasonal zone of the wetland

SEEP 1

A seep wetland of approximately 24.5 ha traverses the eastern extent of the proposed PV site A footprint. The wetland is bordered by the Ash dam facility towards the north-east and crop fields to the south-west. The hydrology of the seep wetland is largely impacted by flow input from surrounding activities, particularly the seepage from the Ash dam, as evidenced by the soil sample taken at the permanent zone of the wetland (**Figure 5.32**). Furthermore, a dam which has been excavated in the wetland hydrogeomorphic (HGM) classification, which has resulted in impounding and pooling of water in the wetland (**Figure 5.32**). Dominant wetland vegetation at this site includes *Typha capensis*, *Phragmites australis* which dominated the permanent wet area and *Imperata cylindrica*, which dominated much of the seasonal zone.

Figure 5.32: a) An overview of Seep 1 wetland and pooling of water at dam, b) Soil sample taken in the permanent zone of the seep wetland indicating signs of soil contamination from the ash dam

SEEP 2

A second seep wetland of approximately 20 ha in extent was identified in the northern extent of the study area. This wetland is located downslope of Eskom's pollution control dams and is bordered by the Komati village to the west. The wetland is dominated by seasonal to permanent hydromorphic soil characteristics (**Figure 5.34**), with sedges and obligate wetland vegetation including *Typha capensis*, *Phragmites australis* and *Cyperus latifolius* occurring in the permanent zone, and *I. cylindrica* occurring in temporary-seasonally wet areas. Evidence of significant levels of disturbance in the form of small drains and berms diverting the water from the Eskom property into the receiving environment was observed in the seep.

Figure 5.33: An overview of the seep wetland: upstream and downstream view

Figure 5.34: Soil sample taken at the permanent zone of the wetland

DEPRESSION

A shallow depression wetland is located within a crop field in the southern extent of the study area, outside of the Project site boundary. The wetland is approximately 3 ha in extent and is cut off from the Project site by the tarred R542. The wetland appears to be geomorphologically intact (other than loss likely sustained to the R542 construction) and driven entirely by rainfall accumulation. The wetland considered to be ephemeral in nature.

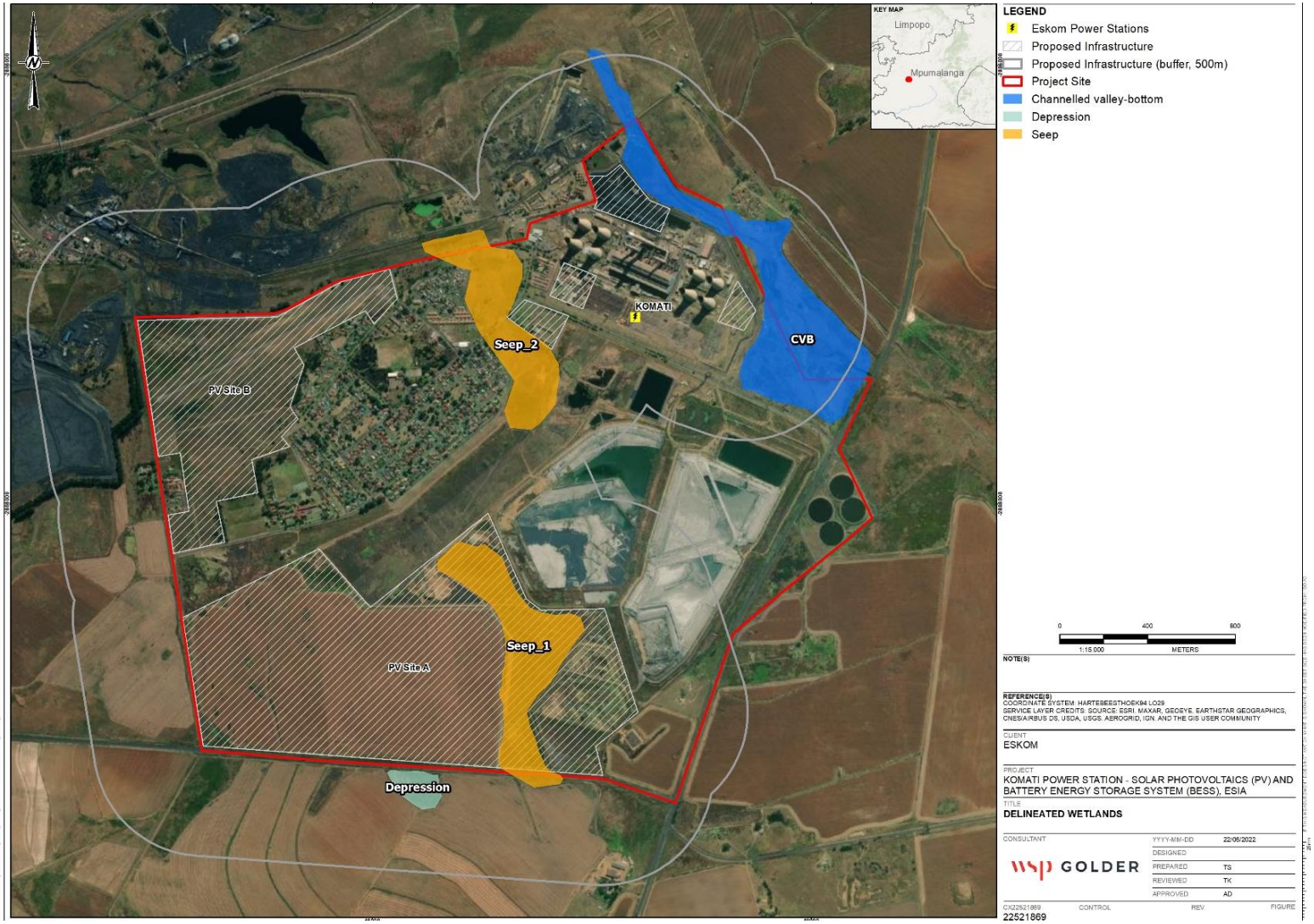


Figure 5.35: Wetland delineation and classification

PRESENT ECOLOGICAL STATE

The most significant drivers of change currently present in the study area include industrial operations (seepage from ash dam, increased water inflow from Eskom operations) impoundment of water at dams, road crossings, mining operations in the catchments, spread of alien invasive species as well formal and informal settlements within the wetland's catchment. The Present Ecological State (PES) score for the wetlands in the study area are presented in **Table 5.14** and discussed in greater detail in the paragraphs that follow.

Table 5.14: Summary of Impact Scores and PES Class

UNIT	HYDROLOGY IMPACT RATING	GEOMORPHOLOGY IMPACT RATING	WATER QUALITY IMPACT SCORE	VEGETATION IMPACT SCORE	OVERALL PES SCORE & CLASS	
CVB	4.8	3.8	6.0	4.0	4.6	D
Seep 1	5.0	3.9	6.0	3.5	4.6	D
Seep 2	5.0	4.2	5.8	5.0	5	D
Depression	3.0	3.0	4.6	4.0	3.5	C

CHANNELLED VALLEY BOTTOM

Major impacts identified within the channelled valley bottom wetland include head cut erosion, impoundment of flow in dams and at road crossings, cattle farming and crop farming, and effluent discharge from industrial operations (Power Station) (**Figure 5.36)**. These impacts resulted in a Largely Modified Impact category (PES D), with the hydrology and water quality component contributing substantially to the modified state of the wetland.

Figure 5.36: Impacts: a) Soil Erosion at CVB main channel; b) pooling of water in dam; c)effluent discharge into the wetland; d) crop farming and cattle grazing in wetland

SEEP 1

The PES of the Seep 1 wetland was considered Largely Modified (PES D), on account of the hydrological state and the water quality of the wetland. The wetland appears to be substantially impacted by the adjacent infrastructure and activities, particularly the ash dam facility. As seen in **Figure 5.37**, the wetland soils are contaminated by sediment inputs from the ash dam. Furthermore, the increased surface water input from the ash dam facility and the impoundment of flow in the excavated dam (**Figure 5.37**) have changed the hydrological regime of the wetland.

Figure 5.37: Ash dam facility and pooling of water at dam

SEEP 2

Major impacts identified in the Seep 2 wetland include increased water inputs into the wetland system from the pollution control dam (PCD), spread of alien invasive species, impoundment of flow along roads and dams, and the presence of drains and trenches (**Figure 5.38**). These disturbances, together with the likely impact on water quality as a result of seepage from the PCDs, have contributed to the Largely Modified state (PES Category D) of the wetland.

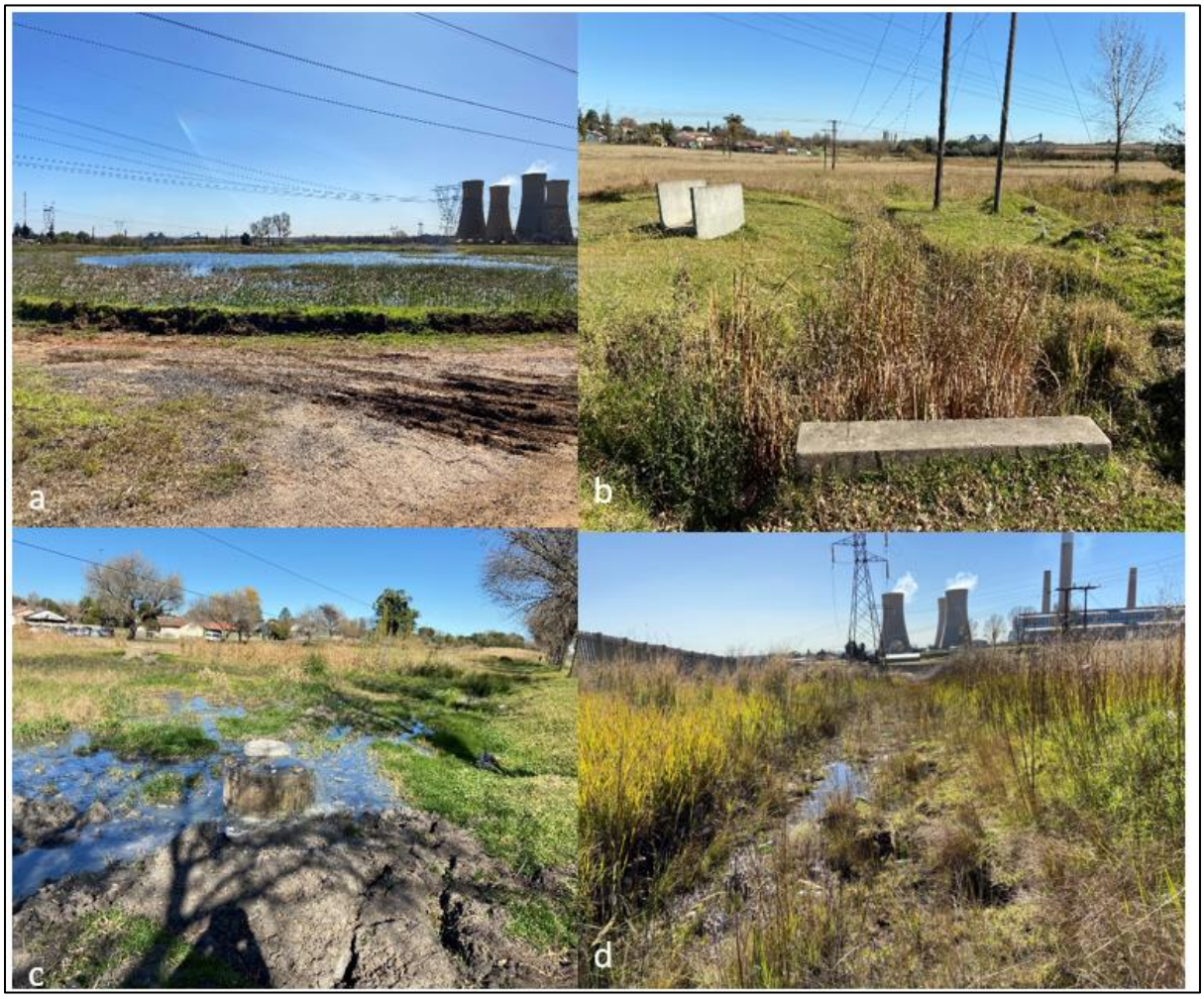


Figure 5.38: Impacts: a) pooling of water at dam; b) trenches and berms in wetland; c) effluent discharge into the wetland from a leaking pipe; d) impoundment of water at roads in wetland

DEPRESSION

The present ecological state of the depression wetland was considered Moderately modified (PES category C). although the wetland is considered to sustain impacts from the surrounding crop farming and the tarred R542 road, the wetland was still considered moderately modified, due to the fact that depression wetlands are mostly rainfall driven and may also receive sub-surface water, therefore the presence of the R542 and crop fields may not have a substantial impact on the hydrology of the wetland.

ECOLOGICAL IMPORTANCE AND SENSITIVITY

All wetlands in the study area were assessed as being of Low /Marginal EIS, with the exception of the CVB wetland which was assessed as being of Moderate EIS (**Table 5.15**). The moderate EIS of the CVB was attributed to its hydrological functional importance as this wetland performs a role in landscape connectivity at the regional level, providing regulating and supporting benefits such as streamflow regulation and flood attenuation.

Table 5.15: Summary of wetland EIS scores and ratings.

WETLAND UNIT	ECOLOGICAL IMPORTANCE AND SENSITIVITY SCORE	HYDROLOGICAL FUNCTIONS SCORE	DIRECT HUMAN BENEFITS SCORE	INTEGRATED EIS SCORE	INTEGRATED EIS RATING
CVB	1.2	1.0	0.0	1.2	Moderate
Seep 1	0.8	0.9	0.0	0.9	Low/Marginal
Seep 2	0.8	0.9	0.0	0.9	Low/Marginal
Depression	0.8	0.9	0.0	0.9	Low/Marginal

ECOSERVICES

The importance scores for the ecosystem services provided by wetlands within the study area are illustrated in the spider diagrams presented in **Figure 5.39**; **Figure 5.40** and **Figure 5.41**. The majority of the ecosystem services were rated as very low in terms of their overall importance. Regulating and supporting services such as sediment trapping, phosphate assimilation, nitrate assimilation and toxicant assimilation were determined as moderate, particularly for the CVB wetland which is also important in terms of streamflow regulation and flood attenuation.

The CVB was also assessed as having a Moderately High importance in terms of the biodiversity maintenance (**Figure 5.39**). This was attributed to the likelihood of the African Grass Owl (*Tyto capensis*) to occur on site based on the result of the national screening tool as well as the avifauna survey undertaken on 17 June 2022 to confirm habitat suitability for the Grass Owl to occur. Furthermore, based on the MBSP freshwater (2011), the CVB was mapped as biodiversity ecological support area.

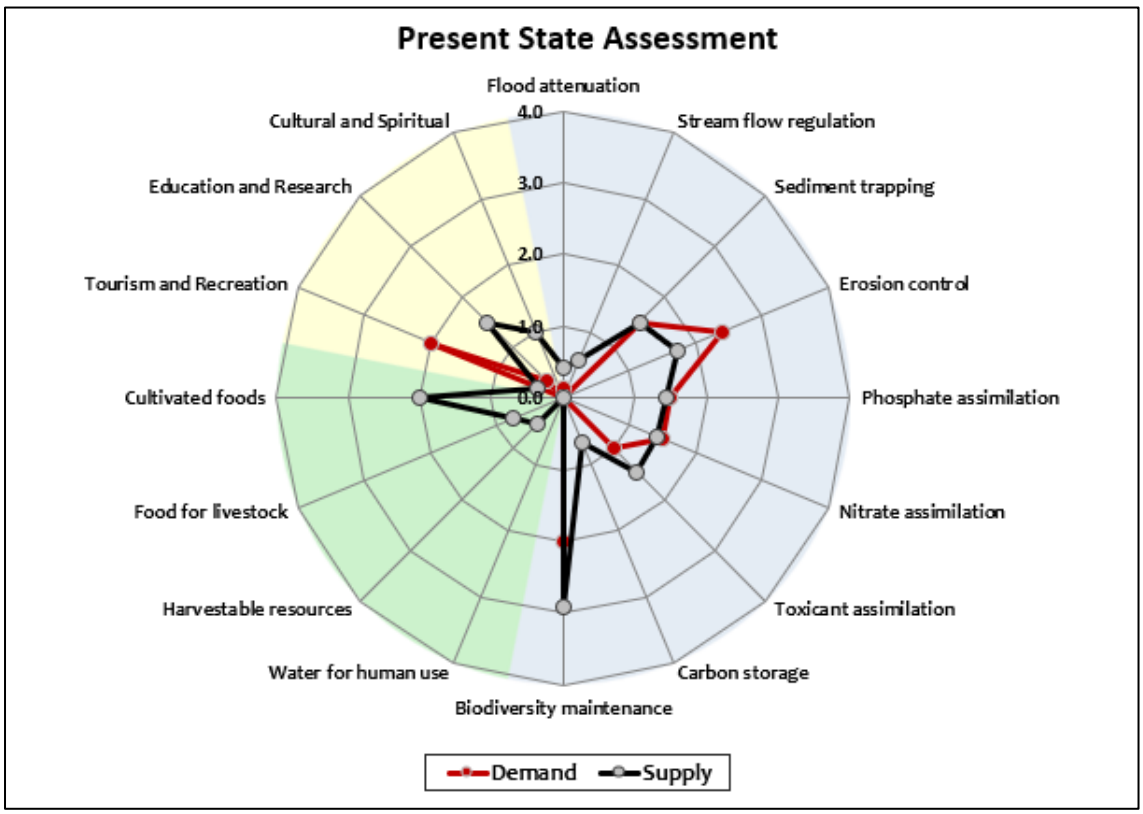


Figure 5.39: Ecosystem Services supplied by/demanded from the CVB wetland.

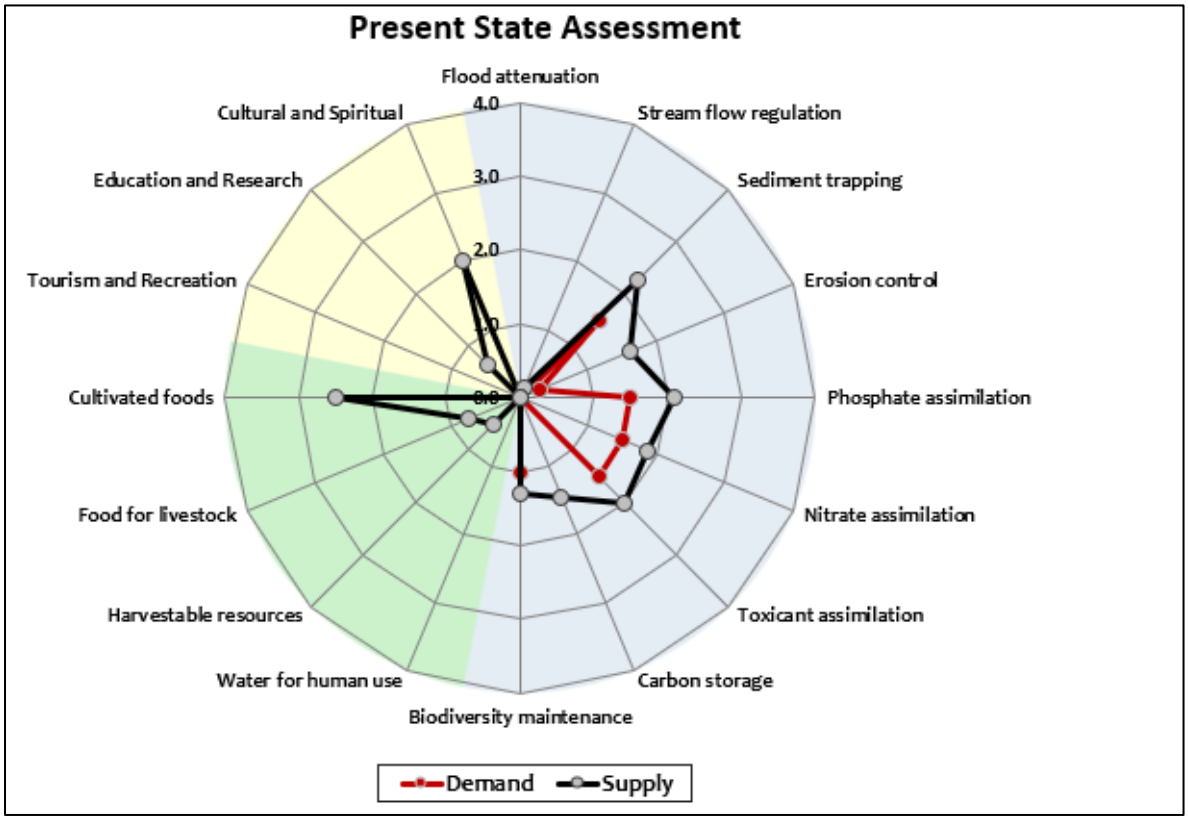


Figure 5.40: Ecosystem Services supplied by/demanded from seep wetlands

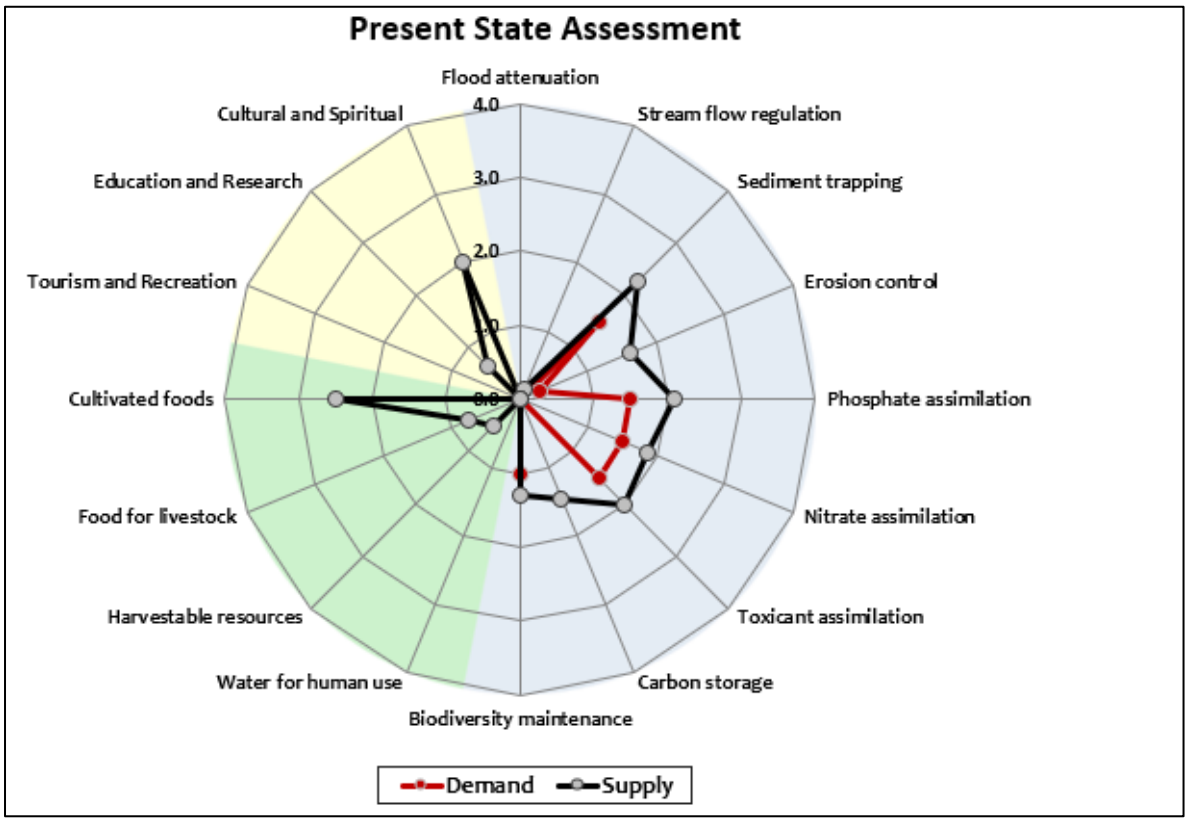


Figure 5.41: Ecosystem Services supplied by/demanded from Depression wetland

EXISTING IMPACTS ON BIODIVERSITY AND DRIVERS OF CHANGE

The proposed project infrastructure will be situated near the existing power generation facilities and activities. All areas visited are currently experiencing some level of impact from the surrounding agricultural activities primarily through habitat transformation, and disturbance arising from power generation facilities and activities.

The presence of the existing facilities within close proximity to the proposed development footprint is expected to have an established impact on the interruption of surface hydrology in wetlands and potentially exacerbate erosion in the study area due to increased surface water runoff as a result of increased hardened surfaces in the study area.

NATURAL, MODIFIED AND CRITICAL HABITATS

The study area is dominated by agricultural cultivation, power station infrastructure and residential/industrial areas, interspersed with some remnant wetland habitat. While some very disturbed wetland habitat has been identified in the eastern extent of PV Site A, it is no longer considered to constitute 'Natural' habitat as defined by WB ESS6, due to its heavily degraded state and loss of ecological function. The channelled valley bottom wetland to the north east of the site, and the seep wetland that crosses the northern boundary of the site, while moderately modified/disturbed, still support biodiversity and deliver ecological services to an extent that enables them both to be considered 'Natural' habitat (**Figure 5.42)** as defined by the lender standards.

At present, no areas of potentially Critical Habitat, as defined by IFC and WB standards, have been identified within the study area.

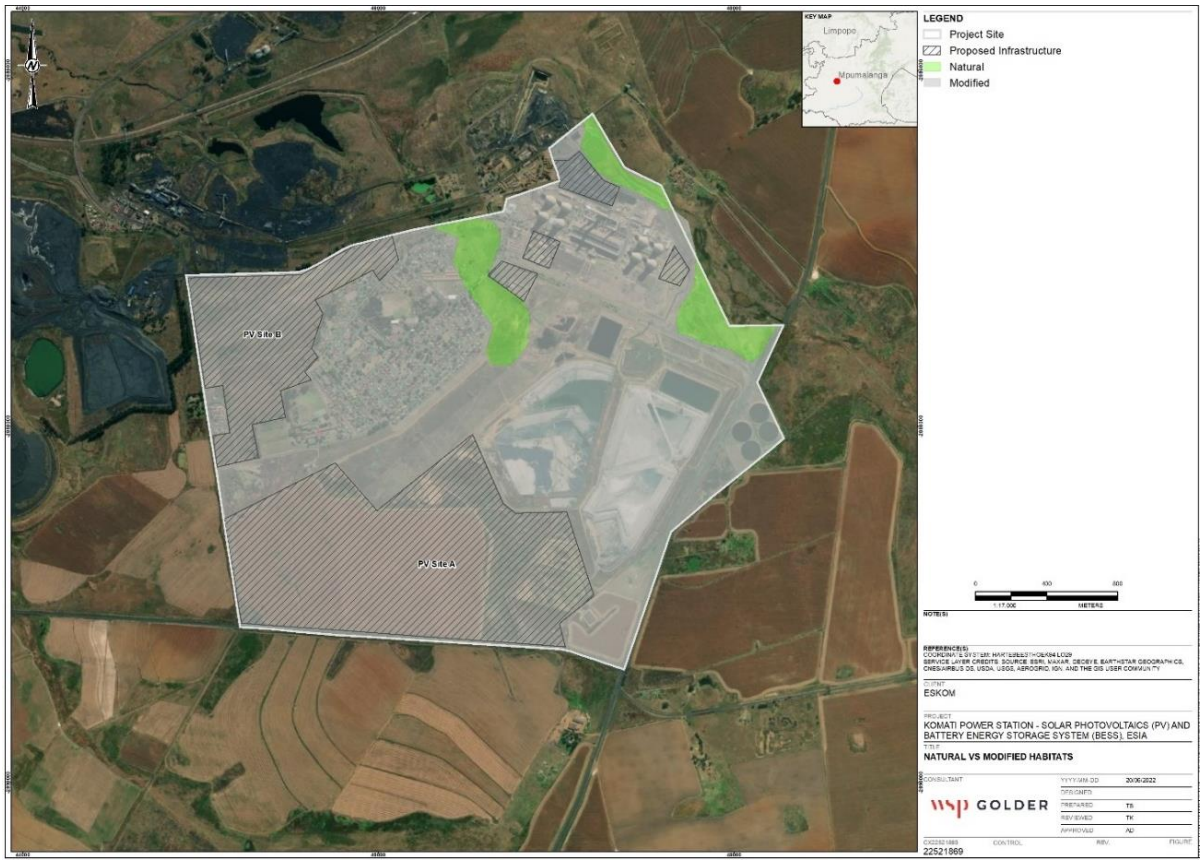


Figure 5.42: Natural, modified and critical habitat

5.3 SOCIAL ENVIRONMENT

5.3.1 TRAFFIC

The following is extracted from the Traffic Scoping Assessment compiled by Innovative Transport Solutions (Pty) Ltd (ITS) and included as ***Appendix G-10****.*

EXISTING ROAD NETWORK

The roads in the vicinity of the proposed development are as follows:

- R543: Is a Class 3 provincial road and is located to the south of the proposed PV Site A and the town of Komati. This road serves as an East-West link between the R544 and the R35.
- R35: Is a Class 3 provincial road and is located to the northeast of the proposed developments and the town of Komati. This road serves as the link between Middelburg and Bethal.
- Main Road: Is a Class 4 municipal road and borders the proposed developments on the western boundaries of PV Site A and PV Site B.
- Flamingo Street: Is a Class 5 municipal road and borders the proposed PV Site A on the northern boundary of the site. Flamingo Street also provides access to the town of Komati.

The locations of these roads relative to the proposed development are shown in **Figure 5.43**.

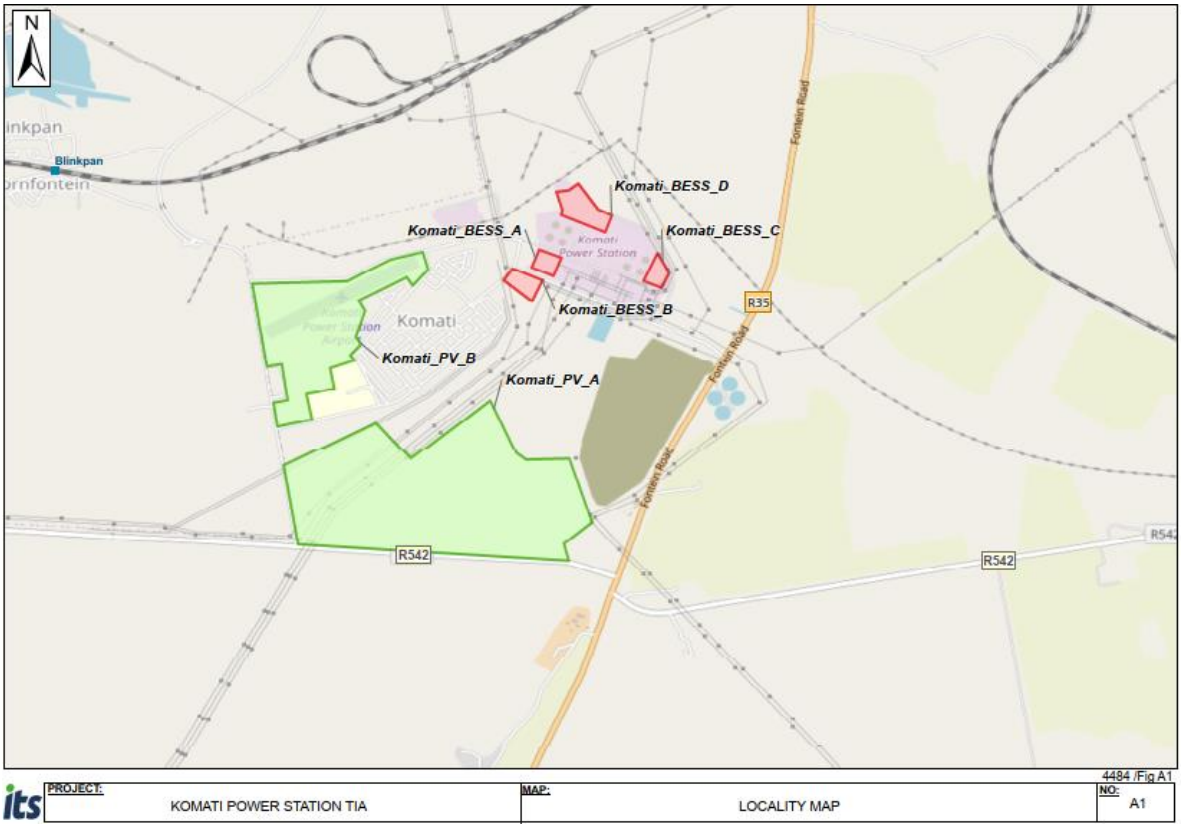


Figure 5.43: Locality map showing roads in the vicinity of the development (ITS, 2022)

TRIP GENERATION

The trip generation of the proposed developments will be calculated based on the estimated number of person trips and truck trips during the construction of the different sites. The operational phase of each site will also develop a certain number of person trips.

The estimated number of person trips will be converted into vehicle trips for the phases and sites. It is expected that the trip generation of the proposed sites will be low to medium during the construction and low to very low during the operational phase.

The expected number of person trips based on the employment opportunities for the developments is 1 285 during the construction phase and 150 person trips during the operational phase. The number of vehicle trips will be adjusted for public transport usage.

The trip assignment of the proposed developments will be calculated based on the land use and traffic patterns once the relevant information has been finalised.

ACCESS

Access to the proposed developments is proposed from Flamingo Street for PV Site A and from the current road that borders the airfield for PV Site B respectively.

CAPACITY ANALYSIS

Traffic counts were conducted, at the intersections shown in **Figure 5.44**, covering a 12- hour period on Wednesday, 1 June 2022.

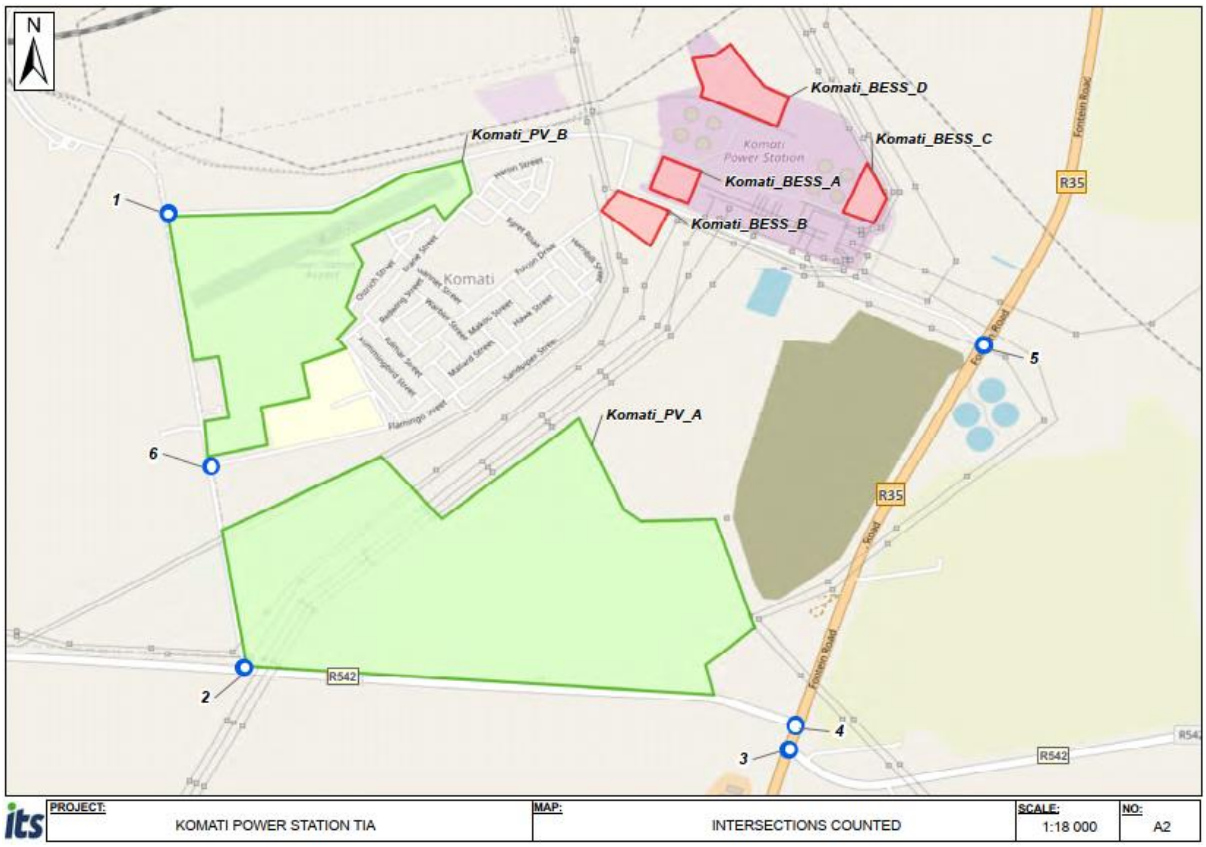


Figure 5.44: Intersections for traffic count

PTV Vistro software was used to conduct the capacity analysis for the intersections included in the study area. The intersections that were included in the analysis are:

- Int 1 – Main Road / Koornfontein Mine Access

- Int 2 – R542 / Main Road
- Int 3 – R35 / R542 to Emalahleni
- Int 4 – R35 / R542 to Hendrina
- Int 5 – R35 / Komati Power Station
- Int 6 – Main Road / Flamingo St

The capacity analysis results for the intersections included in the study area are summarised in **Table 5.16** and **Table 5.17**.

Table 5.16: Capacity Analysis Results for the Weekday AM Peak Hour

SCENARIO	INTERSECTION	INT1	INT2	INT3	INT4	INT5	INT6
Scenario 1: 2022 AM Weekday Peak Hour Background Traffic with Existing Geometry.	LOS	A	A	A	A	B	A
	Del	9.02	9.22	9.91	9.96	10.81	8.94
	v/c	0.03	0.02	0.05	0.08	0.04	0.02
Scenario 2: 2024 AM Weekday Peak Hour Background Traffic with Existing Geometry.	LOS	A	A	A	A	B	A
	Del	9.04	9.25	9.97	10.04	10.93	8.96
	v/c	0.03	0.03	0.05	0.08	0.04	0.02
Scenario 3: 2027 AM Weekday Peak Hour Background Traffic with Existing Geometry.	LOS	A	A	A	A	B	A
	Del	9.08	9.31	10.09	10.14	11.09	8.99
	v/c	0.03	0.03	0.05	0.09	0.04	0.03

Table 5.17: Capacity Analysis Results for the Weekday PM Peak Hour

SCENARIO	INTERSECTION	INT1	INT2	INT3	INT4	INT5	INT6
Scenario 1: 2022 PM Weekday Peak Hour Background Traffic with Existing Geometry.	LOS	A	B	B	B	B	A
	Del	9.53	10	11.81	10.99	10.86	9.24
	v/c	0	0.02	0.11	0.12	0.02	0.01
Scenario 2: 2024 PM Weekday Peak Hour	LOS	A	B	B	B	B	A
	Del	9.54	10.07	11.98	11.1	10.97	9.27

SCENARIO	INTERSECTION	INT1	INT2	INT3	INT4	INT5	INT6
Background Traffic with Existing Geometry.	v/c	0	0.02	0.11	0.12	0.03	0.01
Scenario 3: 2027 PM Weekday Peak Hour Background Traffic with Existing Geometry.	LOS	A	B	B	B	A	A
	Del	9.57	10.16	12.28	11.32	11.15	9.32
	v/c	0	0.03	0.13	0.13	0.03	0.01

The existing road network is operating at acceptable levels of service with the existing geometry. The future background traffic scenarios is also expected to operate at acceptable levels of service with the existing geometry.

PUBLIC TRANSPORT

Due to the locality of the proposed developments, no formal public transport facilities are located in close approximation to the proposed development. It is unlikely that public transport facilities will be required.

5.3.2 VISUAL

The following is extracted from the Visual Scoping Assessment compiled by LOGIS and included as ***Appendix G-8****.*

LAND USE AND SETTLEMENT PATTERNS

The majority of the study area is relatively sparsely populated with a population density of less than approximately 33 people per km^2. Most of these people are located within the towns of Komati (at the power station) or at Blinkpan north of the Goedehoop Colliery. Other than these towns, or residential areas, the rest of the study area is dotted with farm residences or homesteads. These residences are inhabited by the farmers producing mainly maize crops (dryland agriculture) within the region. Other than the agricultural activities the most prominent land use within the area is the mining and the associated power generation activities at the power station.

Some of the homesteads within the study area include[4]:

- Rooiblom
- Welverdiend (1, 2 and 3)
- Broodsnyersplaas
- Blinkpan
- Geluk
- Bultfontein (1 – 8)
- Willmansrust
- Goedehoop (1, 2 and 3)
- Koornfontein

It is uncertain whether all of these farmsteads are inhabited or not. It stands to reason that farmsteads that are not currently inhabited will not be visually impacted upon at present. These farmsteads do, however retain the

[4] The names listed below are of the homestead or farm dwelling as indicated on the SA 1: 50 000 topographical maps and do not refer to the registered farm name.

potential to be affected visually should they ever become inhabited again in the future. For this reason, the author of this document operates under the assumption that they are all inhabited.

The R35 and R542 arterial roads provide motorised access to the project site from respectively the N4 and N12 national roads traversing north and north-west of the larger region.

There are no identified tourist attractions of designated protected areas within the study area.

In spite of the overall rural character of the region, there are a large number of power lines and substations in the study area, mostly associated with the Komati Power Station, the coal mines and the railway lines traversing the study area. These include:

- Camden-Duvha 400kV
- Komati-Matla 275kV
- Arnot-Kruispunt 275kV
- Camden-Komati 275kV
- Komati-Kruispunt 275kV
- Halfgewonnen-Kudu 88kV
- Kudu-Export 132kV
- Broodsnyersplaas-Spoornet 132kV
- Aberdeen-Gloria Colliery 132kV
- Export-Duvha Colliery 132kV
- Kudu-Nasarete 132kV
- Hendrina-Aberdeen 132kV
- Aberdeen-Kudu 132kV
- Aberdeen-Ysterkop 132kV
- Duvha Colliery-Kudu 132kV
- Abina 132kV Overhead Line
- Kudu-Dorstfontein 88kV
- Komati-Kudu 1 and 2 132kV
- Aberdeen-Spoornet 132kV
- Klicoal-Kudu 132kV
- Aberdeen-Gloria Shaft 132kV

There are no additional solar or wind energy generation plants (or applications) within the study area. The closest approved application is the proposed installation of a solar photovoltaic power plant at the Eskom Duvha Power Station, some 18km north-west of the project site.

The photographs below aid in describing the general environment within the study area and surrounding the proposed project infrastructure.

Figure 5.45: View of the PV Site A from the R542 arterial road (LOGIS, 2022)

Figure 5.46: View of the PV Site B from the west

Figure 5.47: Typical coal mining activity within the study area

Figure 5.48: General environment within the study area

Figure 5.49: Power lines near the R542 arterial road

Figure 5.50: The Komati coal-fired power station and associated infrastructure

VISUAL EXPOSURE/VISIBILITY

The result of the viewshed analysis for the proposed Solar PV Energy Facility is shown on the map below (**Figure 5.51**). The viewshed analysis was undertaken from a representative number of vantage points within the Site A and B development footprints at an offset of 5m above ground level (as a worst-case-scenario). This was done to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels, inverters, BESS, etc.) associated with the proposed project. The visual exposure of the BESS is show in **Figure 5.52**.

It should be noted that the viewshed analysis is based on both the Site A and B project boundaries (in their entirety) as provided and that the results may differ once a final layout, structure positions and dimensions are provided during the EIA phase of the project.

The viewshed analysis will be further refined once a preliminary and/or final layout is completed and will be regenerated for the actual position of the infrastructure on the site and actual proposed infrastructure during the EIA phase of the proposed project.

Map 3 also indicates proximity radii from the development footprints in order to show the viewing distance (scale of observation) of the facilities in relation to their surrounds.

The PV facility (both sites) is expected to be visible for up to 6km from the development sites. The visual exposure is relatively scattered due to the undulating nature of the topography, with lower-lying land (e.g. along the Koringspruit and Olifants Rivers) shielded from the infrastructure, and only higher-lying terrain being exposed. It should be noted that the potential visual exposure will not occur in isolation, but rather in conjunction with the existing mining, power line and power station infrastructure in closer proximity to the sites.

The following is evident from the viewshed analyses:

- 0 – 1km
  - The PV facility may be highly visible within a 1 km radius. This zone includes the town of Komati where visual exposure is expected from the outlying edges of the built-up areas. The R542 arterial road will be highly exposed to PV Site A where it traverses south of the site. The R35 could similarly be exposed to PV Site A, but from a slightly longer distance. There are a number of homesteads located within a 1km radius of PV Site A, namely the Goedehoop 3 residence and a number of unnamed houses east of the site.
- 1 – 3km
  - This zone predominantly falls within mining land, vacant farmland an open space, but does contain sections of the abovementioned roads, some houses further south along the R35, and the Geluk homestead east of the power station and the development sites.
- 3 - 6km
  - Within a 3 – 6km radius, the visual exposure will be significantly reduced, especially to the south-east. Exposed residences may include the Bultfontein 2 and 3 homesteads (to the east) and the Broodsnyersplaas and Welverdiend 3 residences to the north.
- > 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 (Solar PV Energy Facility) and the observer, and the developed and industrial nature in closer proximity to the proposed infrastructure.

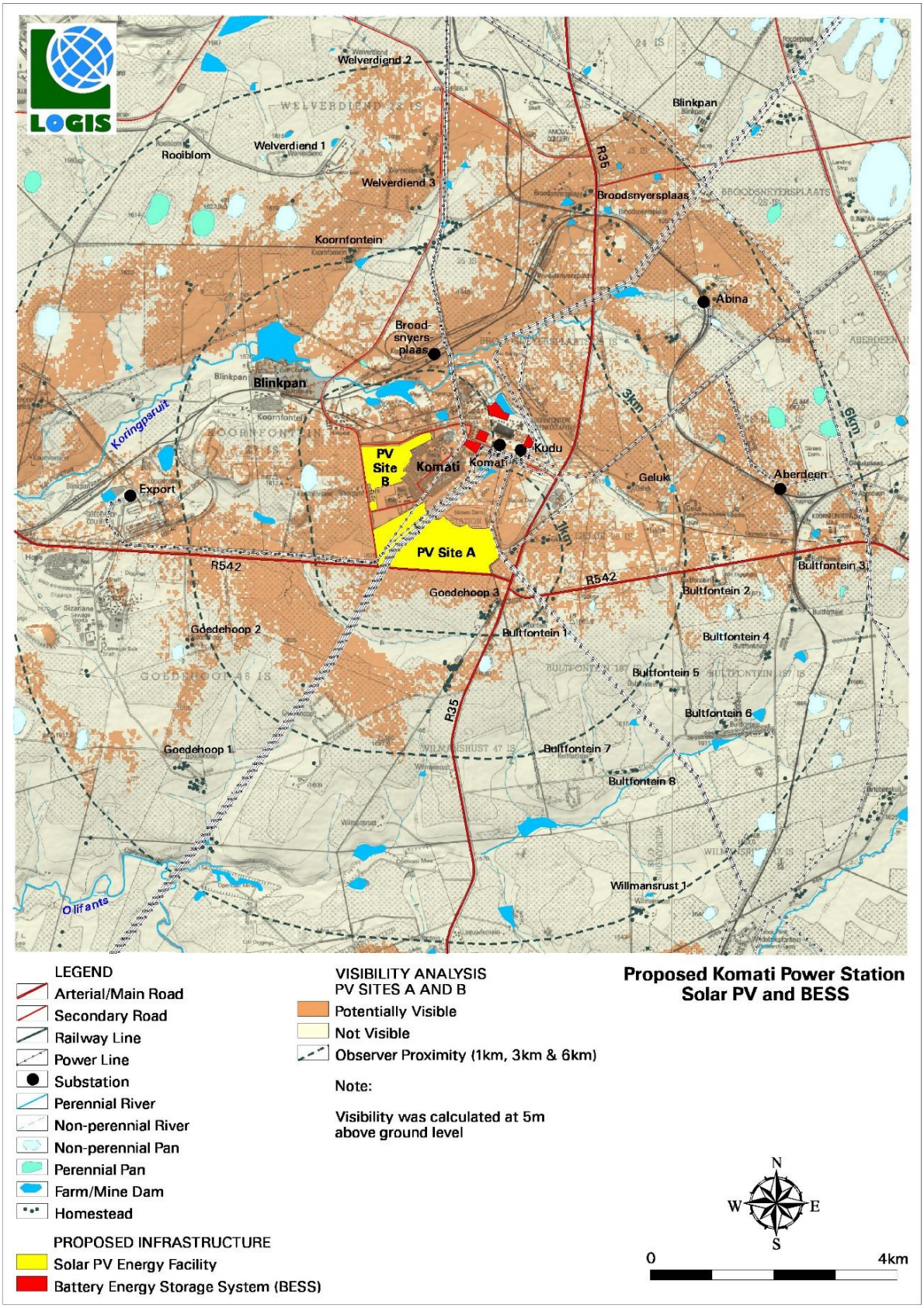


Figure 5.51: Map indicating the potential (preliminary) visual exposure of the proposed Komati Power Station Solar PV Energy Facility

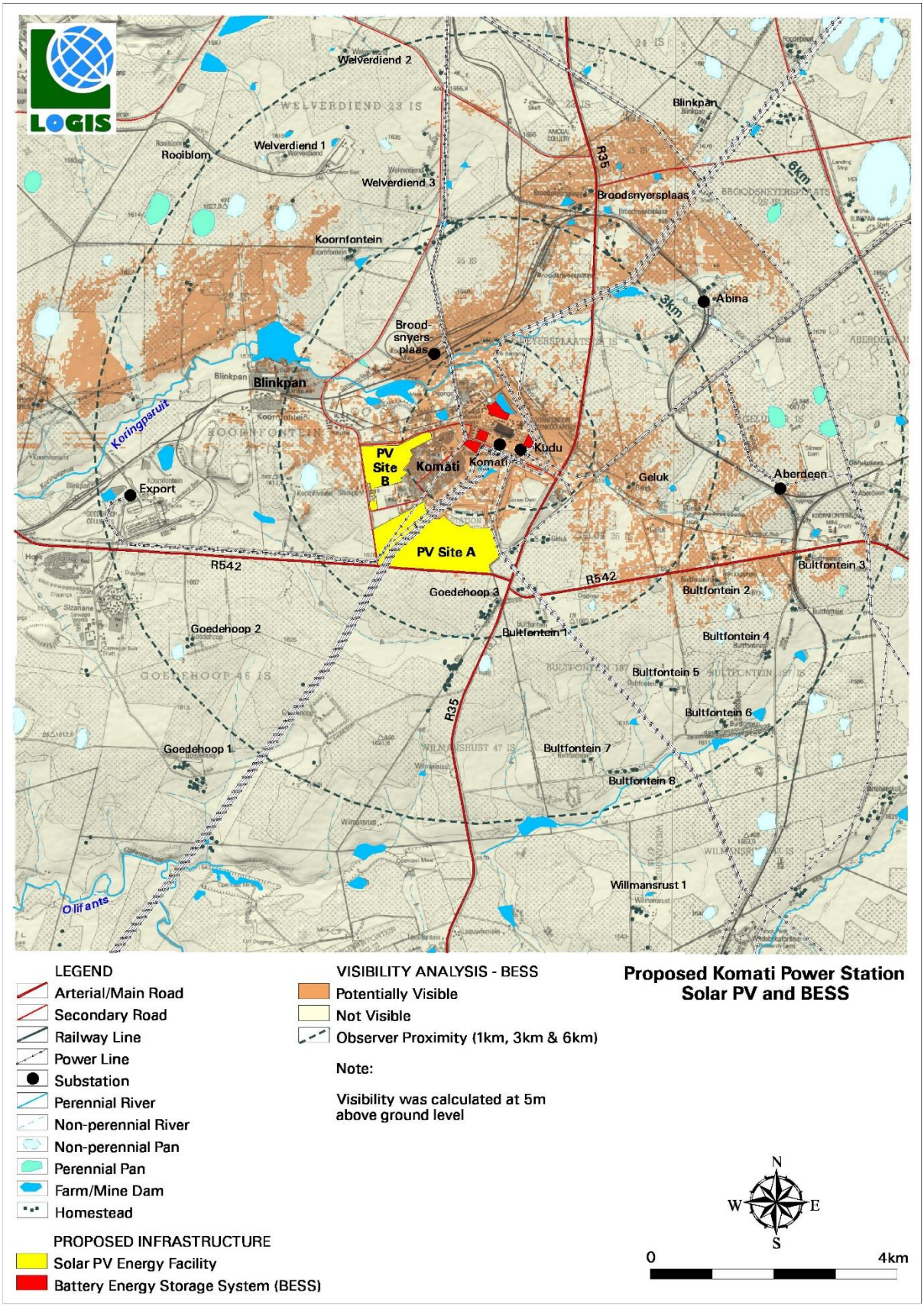


Figure 5.52: Map indicating the potential (preliminary) visual exposure of the proposed Komati Power Station BESS

5.3.3 HERITAGE

The following is extracted from the Heritage Desktop Assessment compiled by APAC and included as ***Appendix G-6****.*

Background research indicates that there are several cultural heritage (archaeological & historical) sites and features in the larger geographical area within which the study area falls, but no known ones in the specific study area.

Based on aerial images (Google Earth) of the study and proposed development parcels the area has been heavily impacted by development of the existing Power Station & its related infrastructure, residential & related developments as well as agricultural activities. The larger geographical area within which the study and proposed development areas are located have also been impacted by mining. The original natural and historical landscape has been severely altered through these activities and if any sites, features or material of cultural heritage (archaeological and/or historical) significance or origin were present here in the past it would have been extensively disturbed or destroyed as a result.

The topography of the study and development area is relatively flat and open, with no rocky outcrops, ridges or hills present.

The Stone Age is the period in human history when lithic (stone) material was mainly used to produce tools. In South Africa the Stone Age can be divided in basically into three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. A basic sequence for the South African Stone Age (Lombard et.al 2012) is as follows:

- Earlier Stone Age up to 2 million – more than 200 000 years ago
- Middle Stone Age less than 300 000 – 20 000 years ago
- Later Stone Age 40 000 years ago – 2000 years ago

It should also be noted that these dates are not a neat fit because of variability and overlapping ages between sites (Lombard et.al 2012: 125).

There are no known Stone Age sites near the study area, although rock paintings (associated with the Later Stone Age) are known south of eMalahleni (Witbank) near the confluence of the Olifants River and Rietspruit, as well as a rock art site to the southeast of Middelburg (Bergh 1999:4-5). Heritage surveys have recorded few outstanding Stone Age sites, rock paintings and engravings in the Eastern Highveld - mainly as a result of limited extensive archaeological surveys. Stone tools have however been recorded around some of the pans which occur on the Eastern Highveld (Pistorius 2010:16). Some individual Later Stone Age artifacts were identified in the larger area during a 2007 HIA for Goedgevonden Colliery, but the location of the site is not indicated (De Jong 2007: 19).

The possibility of finding Stone Age material in the study area is always a possibility. These would however more specifically be individual artifacts and small scatters of artifacts in open-air contexts if they are present.

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artifacts. In South Africa it can be divided in two separate phases (Bergh1999: 96-98), namely:

- Early Iron Age 200 – 1000 A.D
- Late Iron Age 1000 – 1850 A.D.

Huffman (2007: xiii) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

- Early Iron Age 250 – 900 A.D.
- Middle Iron Age 900 – 1300 A.D.
- Late Iron Age 1300 – 1840 A.D.

No Early or Middle Iron Age sites are known to occur in the study area (Bergh 1999: 6-7). According to Pistorius the Eastern Highveld had probably not been occupied by Early Iron Age communities but was occupied by Late Iron Age farming communities such as the Sotho, Swazi and Ndebele who established stone walled settlement complexes. Seemingly these sites are more common towards the eastern perimeters of the Eastern Highveld. Small, inconspicuous stone walled sites have been observed along the Olifants River but are an exception and not the rule (Pistorius 2010:16-17).

There are a fairly large number of Late Iron Age stone walled sites in the bigger geographical area that includes Lydenburg, Dullstroom, Machadodorp, Badplaas and Belfast (Bergh 1999: 6-7). Late Iron Age sites have been identified to the north and east of Middelburg in the vicinity of Belfast (Bergh 1999: 7). Some of these sites might be related to the so-called Marateng facies of the Urewe pottery tradition of the LIA, dating to between AD1650 and 1840 (Huffman 2007: 207). During the 19th century the Ndzundza Ndebele inhabited the land to the north of Middelburg, but it seems as if the area directly surrounding the town was largely uninhabited. The Ndebele of Mzilikazi did move through this area during the *difaqane* which probably left it uninhabited for some time (Bergh 1999: 10-11).

The historical age started with the first recorded oral histories in the area. The first European people to move through this area were the party of the traveller Robert Schoon who passed through during 1836 (Bergh 1999: 13). Although the Voortrekkers moved across the Vaal River during the 1830's, it seems as if Europeans only settled here after 1850 (Bergh 1999: 14-15).

One historic event took place in the region. During the Anglo-Boer War, the British forces under Brigadier-General Beatson were attacked by the ZAR forces, led by Gen. Muller. More than 50 British soldiers were killed. Afterwards, Brigadier-Gen. Beatson accused the Australian forces of cowardice. They mutinied against him, and some were arrested, court-martialled and sentenced to death. Fortunately, these sentences were later commuted to imprisonment. This battle took place on the farm Wilmansrust 47IS, just to the south of the power station. A monument to commemorate this event was erected on this farm, but during the early 1970s it was relocated to the town of Bethal. The site investigation for the power station was started in 1957, and the first unit was commissioned in 1961 and the last in 1966. In 1990 the station was completely mothballed (Van Schalkwyk 2007: 4). Construction of the power station began during 1961.

With no physical field assessments conducted in the study and proposed development areas it is difficult to determine without a doubt if any sites, features or material of cultural heritage origin or significance are located here and if there will be any impacts on such sites as a result of the planned development activities. Based on aerial images of the areas it is however clear that there has been substantial impacts on them (including the development of the existing Power Station and related infrastructure, agricultural residential and industrial) and if any sites, features or material of archaeological and/or historical origin and significance did exist in these specific areas in the past they would have been substantially disturbed or destroyed as a result.

It is evident from the desktop study that archaeological/historical sites and finds do occur in the larger geographical landscape within which the specific study area is located. Based on this it is always possible that open-air Stone Age sites could be found in the area, in the form of individual stone tools or small scatters of tools if present. The possibility of Iron Age sites in the area is highly unlikely with no rocky outcrops, ridges and hills present. The likelihood of recent historical sites and features being present in the area is also low, although this cannot be excluded. If any are present it would most likely be remnants of homesteads and unknown/unmarked graves. During a 2007 Heritage Survey for the Komati Power Station Ash Dam Extension (on the farm Komati Power Station 58IS, a subdivision of the original farm Koornfontein 27IS), no Stone Age, Iron Age or recent historical sites, features or material were identified in the area (Van Schalkwyk 2007: 4).

The planned Solar PV facility development and related infrastructure (including the Battery Energy Storage System and overhead power lines) is located in already heavily disturbed areas and the likelihood of any cultural heritage sites or features being located here is very low.

5.3.4 PALAEONTOLOGY

The following is extracted from the Palaeontology Desktop Assessment compiled by Dr H Fourie and included as ***Appendix G-7****.*

The *Ecca* Group, Vryheid Formation (Figure 12) may contain fossils of diverse non-marine trace, Glossopteris flora, *mesosaurid* reptiles, *palaeoniscid* fish, marine invertebrates, insects, and crustaceans (Johnson 2009). Glossopteris trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the *glossopterids* and *cordaitales*, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

The Glossopteris flora is thought to have been the major contributor to the coal beds of the *Ecca*. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006).

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally LOW to VERY HIGH.

5.3.5 SOCIO-ECONOMIC PROFILE

The following is extracted from the Social Scoping Assessment compiled by WSP and included as ***Appendix*** *E-11. as well as the Socio-Economic Impact Study for the Shutdown and Repurposing of Komati Power Station undertaken by Urban-Econ (2020).*

MPUMALANGA PROVINCE

Mpumalanga Province is located in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries, Mozambique and Swaziland; and four other South African provinces, namely, Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces (**Figure 5.53**). Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. It rises towards mountain peaks in the northeast and terminates in an immense escarpment.

Figure 5.53: South African regional map

Mpumalanga province covers an area of 76 495km² and has a population of approximately 4 300 000. The capital city of Mpumalanga is Mbombela, and other major cities and towns include Emalahleni, Standerton, eMkhondo, Malelane, Ermelo, Barberton and Sabie. The province is divided into three district municipalities: Gert Sibande, Ehlanzeni and Nkangala District Municipalities. These three districts are further subdivided into 17 Local Municipalities. The proposed development falls within the STLM. The STLM falls within the NDM.

The connection of key economic nodes in the province by a vast network of roads provides key opportunities for economic growth and development. The most notable development corridors for development are the Pretoria-Maputo and Johannesburg-Durban lines. As such, there exists multiple corridors for development in the province which may exploit opportunities various opportunities. However, it should be noted that the road transportation network in Mpumalanga is often considered as unmaintained, which may impede economic activity (Urban-Econ, 2020). For full context refer to Section 3.2 of the Urban-Econ Socio-Economic Study.

NKANGALA DISTRICT MUNICIPALITY

The NDM has municipal executive and legislative authority in an area that includes more than one municipality which makes it a Category C municipality , located in the Mpumalanga Province. It is one of three district municipalities in the province, making up 22% of its geographical area. The NDM comprises the Victor Khanye, Emalahleni, Steve Tshwete, Emakhazeni, Thembisile Hani, and Dr JS Moroka local municipalities (**Figure 5.54**). The NDM is headquartered in Middelburg. The NDM is the economic hub of Mpumalanga and is rich in minerals and natural resources.

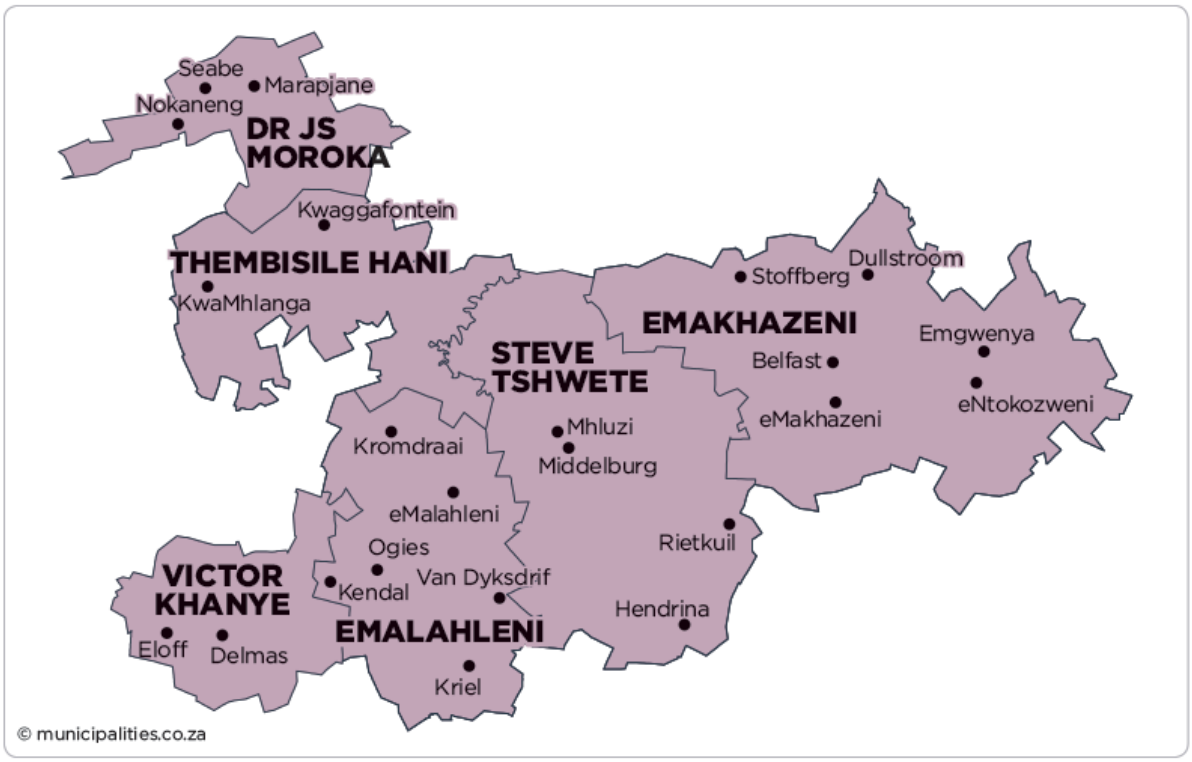


Figure 5.54: Nkangala District Municipality

STEVE TSHWETE LOCAL MUNICIPALITY

STLM is approximately 3,976 square kilometres in extent, representing 23.7% of the NDM's land mass. To the west it is bordered by the Emalahleni and Thembisile Hani Local Municipalities; the Govan Mbeki and Msukaligwa Local Municipalities in Gert Sibande District to the south; and the Emakhazeni and Chief Albert Luthuli Local Municipalities to the east (**Figure 5.54**). Adjacent to the north of the STLM is Elias Motsoaledi Municipality which forms part of the Sekhukhune District Municipality in Limpopo Province.

POPULATION

The STLM's population increased to 278 749 between 2011 and 2016 (**Figure 5.55**) which represents an increase of 21.3% over the five-year period. The growth rate was 4.3% over the same period. It is estimated that in 2030 the population of the municipality will be approximately 510 000.

Based on the Census 2011 data, the Komati PSA had a population of between 4 000 and 5 000 persons a decade ago. Most of the persons within the study area resided in Komati village, with Sizanane representing the smallest community in the study area.

The Blinkpan settlement has the largest population size of the mentioned main settlements within the study area of Komati. However, it has the smallest household size when compared to the Komati and Sizanane settlements. The Komati and Blinkpan settlements each have an average household size of 2.5 persons per household, while the Sizanane settlement has the smallest average household size at 1.4 persons per household.

For full context refer to Section 3.4.5 of the Urban-Econ Socio-Economic Study.

Gender

The gender distribution of the municipality was almost equal with females representing 48% and males 52% of the population in 2011(**Figure 5.56**).

As per the Census 2011, there were more males than females in the area, with an average male-to-female ratio of 1.55 to 1 (i.e. 155 males per 100 females). Sizanane had the highest male-to-female ratio despite being the smallest community within the PSA. The above ratio reflects the nature of the settlements being largely linked to the mining operations and hosting workers who migrate into the area.

Representatives of the local communities suggested that the distribution between males and females may have changed since the Census due to the change in the structure of the local economies linked to the closure of mining operations. Conversely, some of the community members suggest that there is an equal distribution between males and females in the PSA. Importantly, a significant shift in the area in terms of gender distribution is apparent and the 2011 status quo no longer stands (Urban-Econ, 2020).

For full context refer to Section 3.4.5 of the Urban-Econ Socio-Economic Study.

Age

People aged between 15 and 64 years old represent 70.7% of the population with 25% of the population representing the young and 4.3%, the elderly.

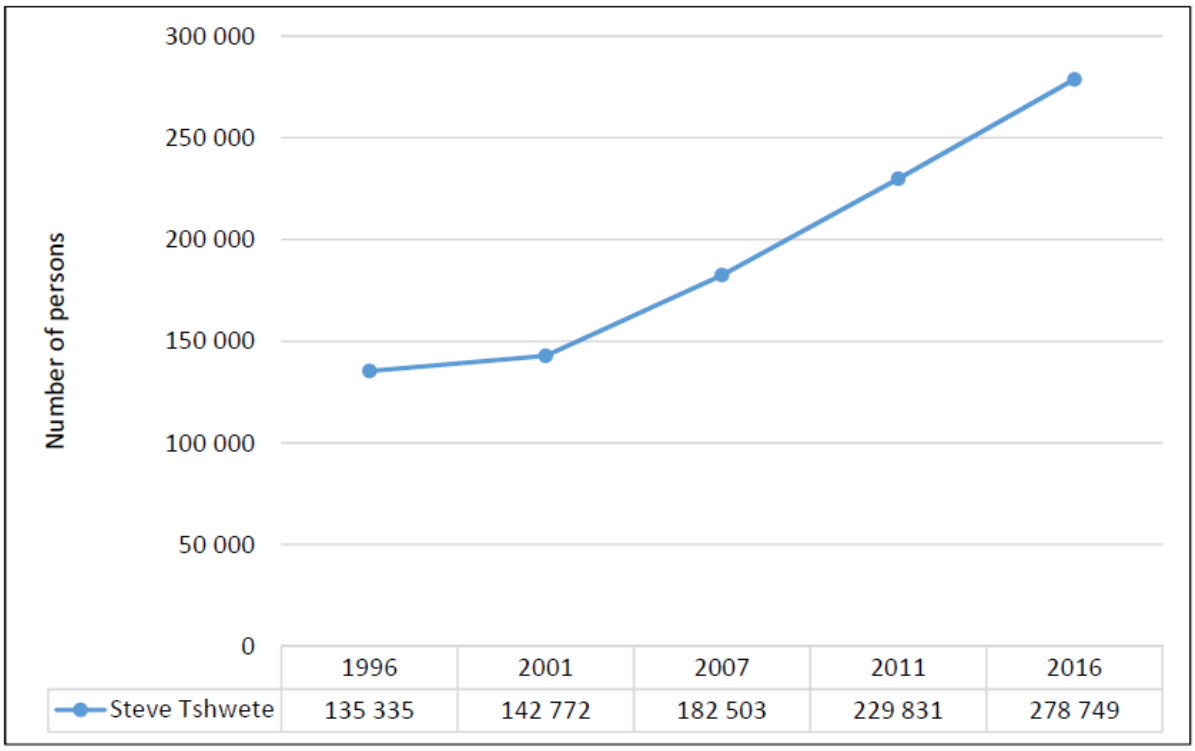


Figure 5.55: STLM population size

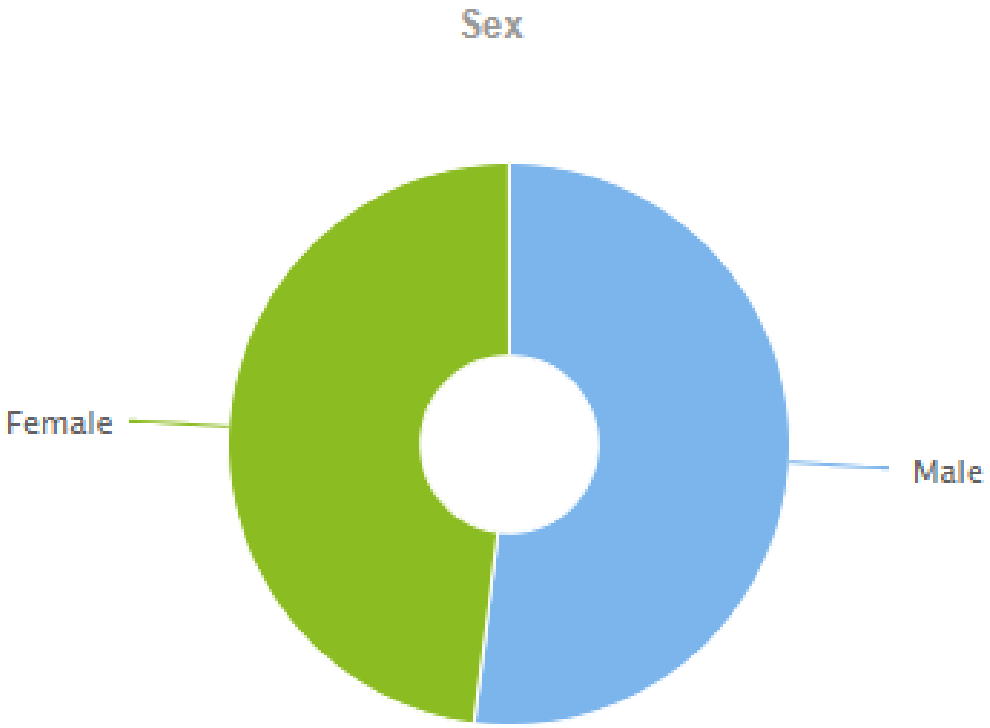


Figure 5.56: STLM gender distribution

ETHNICITY AND LANGUAGE

Almost 74% of the municipality is represented by Black African people followed by nearly 22 % White and smaller portions representing remaining ethnicities as shown in **Table 5.18.**

Table 5.18: Distribution of STLM by population group

GROUP	PERCENTAGE
Black African	73.6%
Coloureds	2.6%
Indian or Asian	1.6%
White	21.8%
Other	0.4%

Isizulu is the language most spoken in the municipality followed by Afrikaans, isiNdebele, Sepedi and other in smaller proportions (**Table 5.19**).

Table 5.19: Distribution of STLM by language spoken

GROUP	PERCENTAGE
IsiZulu	27,8%
Afrikaans	22,1%
IsiNdebele	14,6%
Sepedi	10,6%
English	5,8%
Others	19.1%

EDUCATION

In 2011, approximately 17 000 people over the age of 20 had no form of formal education and approximately 42 500 people have completed secondary education. Approximately 2.2 % (5 050 people) have received higher educational training. **Table 5.20** shows the levels of education represented in the municipality.

Table 5.20: Distribution of the levels of education represented in the municipality

GROUP	PERCENTAGE
No Schooling	3,1%
Some Primary	37,8%
Completed Primary	5,8%
Some Secondary	31,1%
Completed Secondary	18,5%
Higher Education	2,2%
Not Applicable	1,5%

VULNERABLE GROUPS

Vulnerable groups include the economically disadvantaged, racial and ethnic minorities, the uninsured, low-income children, the elderly, the homeless, those with HIV, and those with other chronic health conditions, including severe mental illness and indigenous people. There are no identified vulnerable groups in the project area.

INDIGENOUS PEOPLE

Due to the varied and changing contexts in which indigenous peoples live, there is no universally accepted definition of indigenous peoples. For this Project, the term indigenous people is used in a generic sense to refer to a distinct, vulnerable, social, and cultural group, which possess the following characteristics in varying degrees:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others

- Collective attachment to geographically distinct habitats or ancestral territories in the Project area and the natural resources in these habitats and territories
- Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- An indigenous language, often different from the official language of the country or region (World Bank, 2013)

The screening was undertaken to determine whether indigenous peoples are present in, or have a collective attachment to, the Project-affected area. There are no indigenous people as defined above in the Komati power station area.

EMPLOYMENT AND INCOME PROFILE

The unemployment rate of STLM decreased from 19.7% in 2011 to 16.4% and is among the lowest in the municipalities within the Mpumalanga province. The unemployment rate for females of 21.8% is nearly double that of males at 12.9%. The youth unemployment, as recorded by the 2011 census, is 27.1%.

TYPES OF EMPLOYMENT

In 2011, there were 682 people employed in the formal sector and 76 in the informal sector (Urban-Econ, 2020). Eskom is the major employer in the area. Komati is also surrounded by agricultural land where people will be employed in this sector.

LABOUR

Eskom will adhere to the International Labour Organisation Conventions which have been ratified by South Africa. It is estimated that the Solar PV, BESS and WEF Project will create approximately 1300 direct employment jobs during the construction phase and approximately 150 jobs during the operational phase.

CHILD LABOUR

Eskom will not employ child labour in the construction or in the operation of the facilities.

HOUSING

The number of households in the STLM increased by almost 22 000 from 64 971 in 2011 to a total of 86 713 in 2016. The STLM provides services such as water, electricity and waste to these households. The average size of a household has declined from 3.5 to 3.2 people in the same period.

HEALTH

The main challenges to the health care in the STLM is the prevalence of HIV/AIDS. A decrease in the HIV/AIDS prevalence rate was recorded between 2011 and 2013, seeing a decline from 52% to 43%. This decrease is attributed to increased HIV Counselling and Testing campaigns in the local municipality and increased community awareness.

SECURITY AND SAFETY

The Komati community is serviced by the Blinkpan Police Station. The crime statistic published for the 2020/2021 financial year by the South African Police Service indicated that only 62 contact crimes were committed during the period with Assault with the intent to inflict grievous bodily harm being record, Common assault and Robbery with aggravating circumstances representing 89% of contact crimes.

In total, 298 community reported serious crimes were reported at the Blinkpan Police Station with 71% (208) being theft, followed by contact crimes (21%) and property related crimes (6%).

Eskom will either provide or contract security during the construction and operation of the Project these will be trained professionals and will need to sign a code of conduct committing themselves to the protection of the local communities.

GENDER-BASED VIOLENCE (GBV)

In terms of gender-based violence, i.e. rape, sexual assault, and contact sexual offences, two cases were recorded at the Blinkpan Police Station during the 2020/2021 period. Both cases were rape cases. GBV cases are not always reported however updates will be made as studies progress throughout the project.

There is no organisation based in the Komati area that offer GBV services to victims. However, the Department of Social Development established a GBV command centre in 2013 that allows a survivor to contact the centre

and be assigned a social worker close to them. There are national NGOs that offer services to GBV victims namely, People Opposing Woman Abuse (POWA), Sonke Gender Justice and Shukumisa.

GBV victims can also include men and support services for this group in the area is currently unknown.

No further information was available from the Urban Econ Socio-Economic Studies.

AGRICULTURAL LANDS

There are 8 681 households that take part in agricultural activities in the STLM. The main types are poultry (28%), livestock (24%) and vegetable growing (21%). Other crops and other types of agriculture represent 9% and 19% respectively.

Urban-Econ (2020) states the there is a richness of agricultural resources and land capability in the area surrounding the Komati Power Station. The vast portions of land in the PSA have the potential for cultivation. Most of the agricultural activities undertaken in the area are done on a commercial scale, albeit on dryland. There are few portions, however, where there is irrigated commercial farming in the area. Considering that the area has potential for agricultural production, there is an opportunity to introduce or enhance agro-processing activities.

For full context refer to Section 3.4.4 of the Urban-Econ Socio-Economic Study.

The Soils Assessment identified agriculture activities on Solar Site A. This will be further investigated during the EIA.

SOCIAL AND PHYSICAL INFRASTRUCTURE

SCHOOLS

There is one school in the Komati area (Laerskool Koornfontein). The nearest secondary school (Allendale Secondary School) is 27 kilometres from Komati.

HEALTHCARE

The nearest hospital to the project location is the Impungwe Public Hospital which is 30 kilometres from Komati power station. The nearest provincial hospital is the Middleburg Provincial Hospital, which is 42 kilometres from Komati, in Middelburg

WATER

In the STLM, 60.8% of households have access to piped water inside dwellings and 24.2% have access to piped water inside the yard. Community stands provide piped water to 13.1% of households while the remainder of the households rely on tankers, boreholes, dams and other sources of water.

Raw water for Komati Power Station is obtained from the Nooitgedacht Dam (with a capacity of 78 477 m^3) on the Komati River. Water is pumped to reservoirs at Klipfontein from where it gravitates to the power station; the total distance is approximately 64km. The water is treated by Komati Power Station to potable water standards as well as for power production.

The water treatment plant also supplies water to certain communities. The plant's capacity is 4.3 ML/day for potable water and 5.7 ML/day for demineralized water (Urban-Econ, 2020).

The following communities receive water directly from the power station:

- Komati Village – 45 ML/month;
- Lakama Guesthouse – 1.5 ML/month; and
- Koornfontein mine – 8 ML/month.

For full context refer to Section 3.4.4 of the Urban-Econ Socio-Economic Study.

ELECTRICITY

Based on the District Municipality's IDP, the STLM's energy supply is licensed from a third party. The supply has become strained due to supply infrastructure failures and the unwillingness of coal suppliers to become long-term suppliers to Eskom. The export market is more lucrative for the coal suppliers.

The STLM must make efforts to address the electricity supply issues by emphasising the following:

- Partially licenced municipalities to provide electricity;

- Municipalities exceeding their notified maximum demand;
- Non-payment of bulk electricity;
- Ageing of bulk electricity Infrastructure;
- Inadequate bulk electricity infrastructure to meet the demand;
- Lack of operation and maintenance plan;
- Theft of solar panels from the borehole pump station; and
- With the stated supply constraints, households in the STLM have good access to electricity with a 91% of households having access to electricity.

ACCESS TO SANITATION

Over half (51%) of NDM households have access to flush toilet facilities and 43% use pit latrines. The rest of the households rely on other types of sanitation facilities. The majority of STLM households (84%) have access to flush toilet facilities,9% use pit latrines and the rest rely on other types of facilities.

ACCESS TO WASTE REMOVAL

In contrast to the NDM, who only 40% of its population makes use of refuse dumps, 84.7% of the households in the STLM have their waste removed weekly by the municipality and only 11% of the households make use of a refuse dump.

TELECOMMUNICATIONS

Komati is serviced by all the major network providers in the country. It has access to 4G/LTE coverage and access to the internet via the service provider rain.

PUBLIC TRANSPORT

The Komati area relies on taxis as the main form of public transportation. The area is serviced by the Middelburg District Taxi Association. Buses also operate in the area but are mainly used as scholar transport.

5.4 SENSITIVITY MAPPING

A preliminary consolidated environmental sensitivity map (

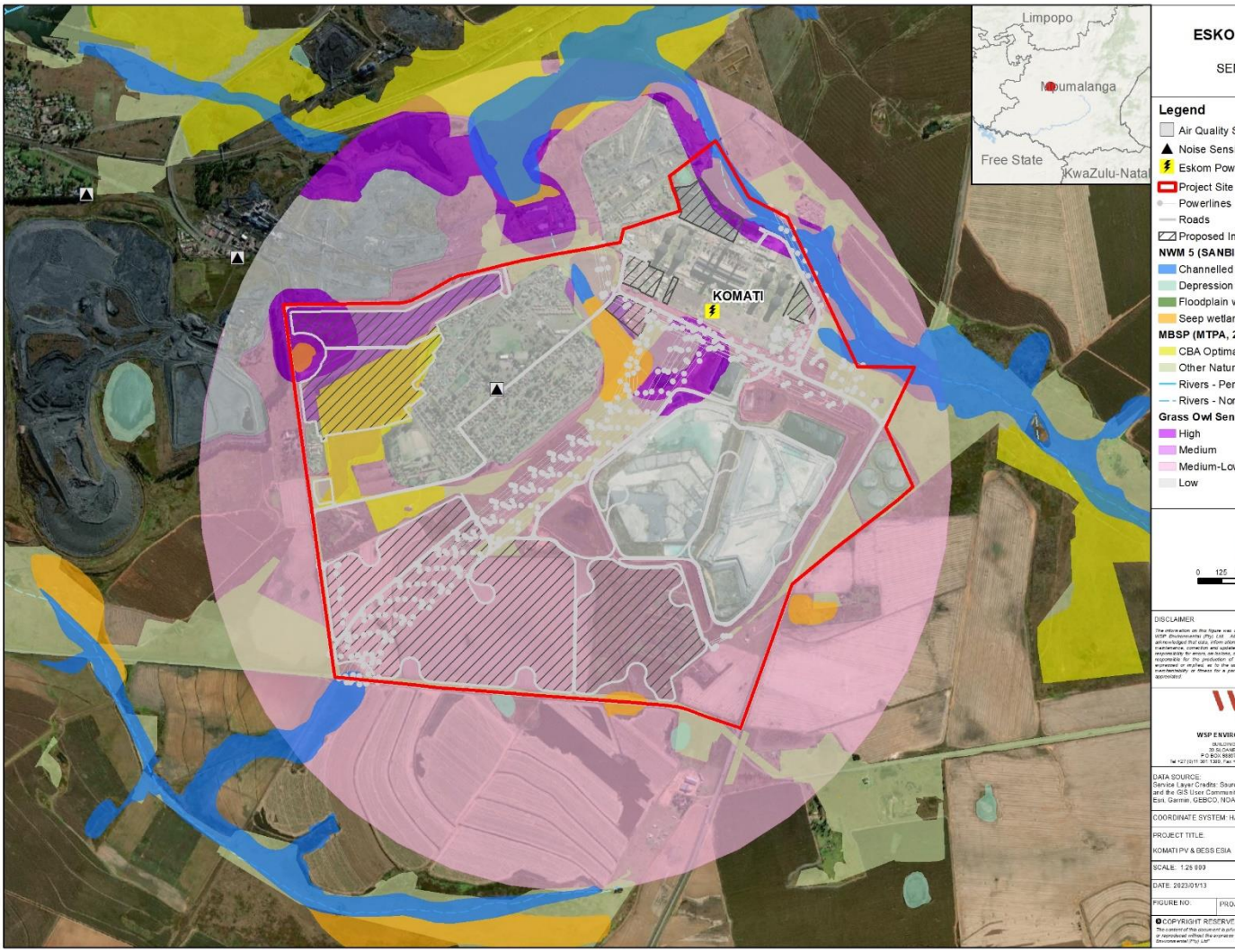


Figure 5.57) has been compiled based on the sensitivities and buffers outlined in the following specialist studies:

- Air Quality Impact Assessment:
  - Sensitive receptors within a 10 km radius of the proposed project
- Noise Impact Assessment:
  - Sensitive receptors within a 5 km radius of the proposed project
- Surface Water Scoping Study:
  - Rivers
- Terrestrial Biodiversity Scoping Study:
  - CBAs
  - Other Natural Areas
  - Grass owl sensitivity map
- Aquatic Biodiversity Scoping Study:
  - Wetlands

It must be noted that the sensitivity ranking does NOT specify No-Go areas. It is noted that there are no heritage sites that have been identified to date (i.e. at this Scoping phase) at the project development site.

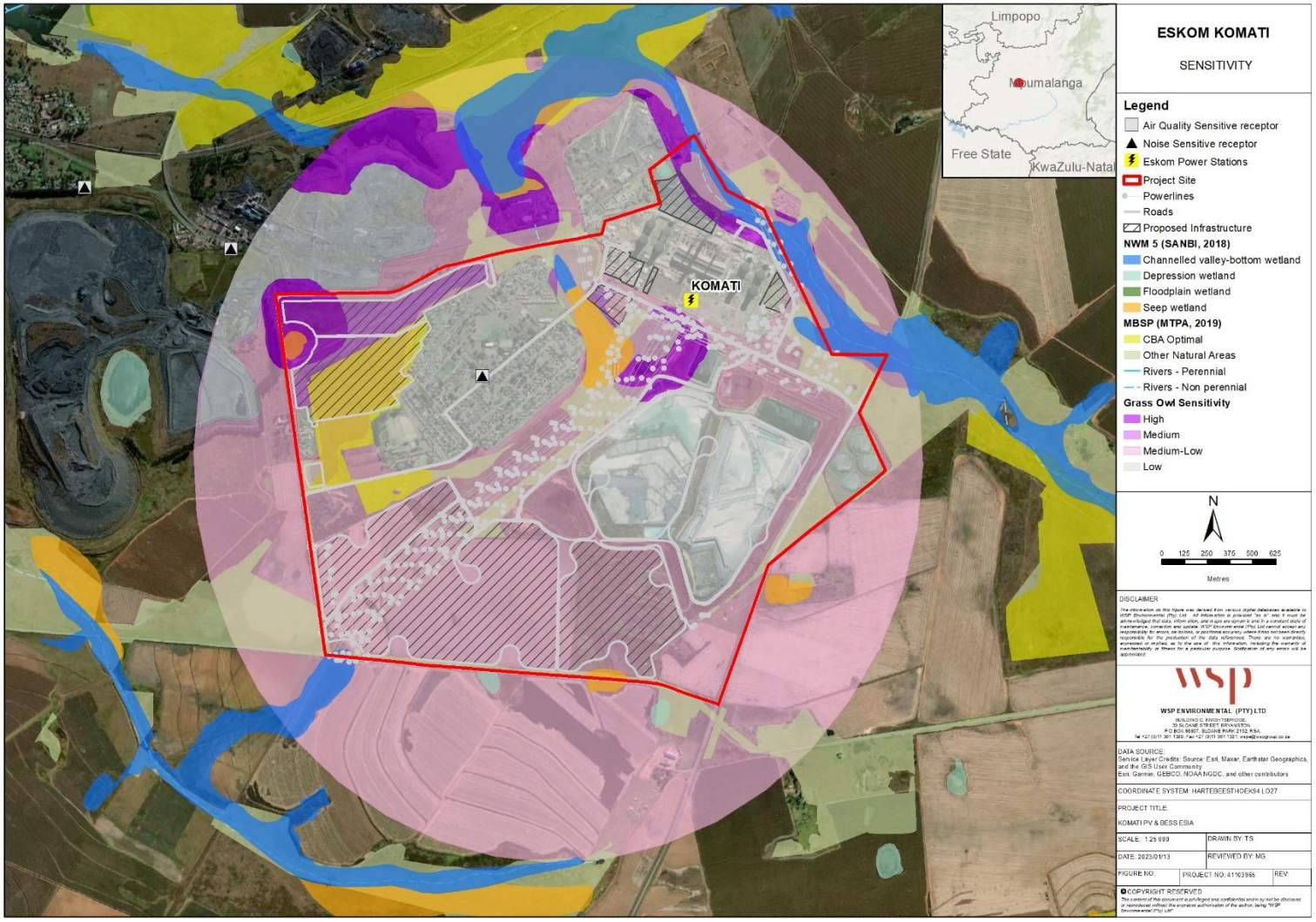


Figure 5.57: Site layout overlain onto a Preliminary Consolidated Sensitivity Map

6 IDENTIFICATION OF POTENTIAL IMPACTS

The scoping phase of a S&EIR process is aimed to identify potential impacts that are most likely to be significant and which need to be assessed as part of the S&EIR process. The determination of anticipated impacts associated with the proposed development is a key component to the S&EIR process. This Chapter identifies the anticipated environmental and social impacts associated with the proposed project.

The issues identified stem from those aspects presented in **Section 5: Environmental and Social Context** and the description of project components and phases as outlined in **Section 4: Project Description**. Each significant issue identified is to be investigated further during the S&EIR process. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

The potential environmental and social impacts of the Solar PV and BESS facilities have been identified at a high level and are discussed in **Table 6.1**. These impacts and mitigation measures will be further assessed during the EIA Process. The Impact Assessment Rating for these impacts are included in **Section 7**.

Table 6.1: Potential impacts for Solar and BESS facilities

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
Air Quality	**Dust And Particulate Emissions** Heavy construction activities are a source of dust and PM_{10} and $PM_{2.5}$ emissions that can have a temporary impact on the local ambient air quality. Dust and particulate emissions vary substantially on a daily basis, depending on the level of activity, the specific operations and the prevailing meteorological conditions. It must be noted that emissions from construction and decommissioning activities are highly uncertain due to the site specific and erratic nature of construction activities. The construction and decommissioning phases are also expected to occur during daytime hours only and as such is considered to be limited and short-lived to the local project site area. Minimal air quality impacts are anticipated during the operational phase of the proposed project, with changes in air quality unlikely to occur at the nearest sensitive receptors.	✓	✓	✓	– Information regarding construction activities should be shared with all local communities (such as the Komati Village). – Complaint's register must be kept to record all events. – When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. – Speed limits (approximately 20-40 km/hr) can be enforced to control open dust sources. – Wind speed reduction is a common method used to control open dust sources at construction sites as wind barriers and windbreaks tend to be readily available. It is also recommended to cease high dust construction activities, for e.g. land-clearing, during high wind speed events. – Application of water can be used to reduce dust emissions
Noise	**Increase In Noise Levels** Given the type of noisy activities and vehicles used during the construction and decommissioning activities of the proposed project, increased noise levels are likely to be anticipated at nearby receptors within a ~ 2.5 km radius (i.e at SR1, SR3 and SR4) of the proposed site during the construction phase. Importantly, for every doubling of distance, the sound level reduces by 6 db. Noise levels are thus expected to be of most significance at SR1 (Komati village) which is within the proposed project site boundary. However, it must be noted that noise levels from the activities are highly uncertain due to the site specific and erratic nature of the activities, with no set locations for equipment at a given time. Further, the activities are expected to occur during daytime hours only and is therefore limited and short-lived to the local project site area.	✓	✓	✓	– Planning construction activities in consultation with local communities (such as the Komati Village) so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. – When working near a potential sensitive receptor (within 100 m), limit the number of simultaneous activities to a minimum as far as possible. – Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines. – Selecting equipment with the lowest possible sound power levels. – Ensuring equipment is well-maintained to avoid additional noise generation.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Minimal noise impacts are anticipated during the operational phase of the proposed project, with changes in noise unlikely to occur at the nearest sensitive receptors.				— A drop height policy should be implemented onsite to reduce the level of noise generation when handling materials. All equipment operators should be trained in the policy such that drop height reduction is implemented onsite. — It is recommended that a maximum speed of 20-40 km/h should be set on all unpaved roads. — Ensure a reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement. — Encouraging the receipt of materials during non-peak traffic hours to avoid traffic build-up and associated noise. — Vehicles should not be allowed to idle for more than five minutes when not in use.
Surface Water	**Stormwater Runoff** Stormwater runoff could, in the case of the temporary construction yards, laydown areas, and offices for the construction and decommissioning workers, potentially come in contact with areas dedicated for the handling of contaminants. During operations, stormwater runoff in the vicinity of the substation / control building and solar PV's could come into contact with dedicated areas where hazardous substances are handled such as fuels and oils which could result in contaminated stormwater runoff being discharged downstream. Furthermore, typical activities during maintenance may include washing of solar panels. The method for cleaning of saolar panels is still being investigated.	✓	✓	✓	— Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site. — After construction, the land must be cleared of debris, surplus materials, and equipment. All parts of the land must be left in a condition as close as possible to that prior to construction. — Avoid clearing during the wet season when short heavy downpours can be expected. This should help to limit erosion. — Minimize the extent of earthworks. — Encourage the use of natural flow paths downstream of construction sites. — The discharge of stormwater should be spread over a wide area to reduce the energy as a result of concentrated flow and return to dispersed flow downstream of the construction site. — Re-use stockpiled soil within as short a period as possible.
	Erosion Soil stripping, stockpiling, excavations of underground cabling, foundations for the solar PV array mounting structure and construction of stormwater berms may result in loss of soils through erosion, particularly for topsoil stockpiles w	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	ith unvegetated steep slopes, resulting in increased sedimentation to water resources. In the operational phase, the potential impacts due to the additional hardened surfaces include erosion of the surrounding environment. Eroded soil particles carried to downstream water resources can also result in the decrease in quality of nearby w atercourses, due to sedimentation.				– Protect structures such as the solar PV bases and substation / control building from localised flooding by constructing cut-off berms / diverting flow on the uphill side in flood prone areas. – Prevent stormwater runoff coming into contact with dedicated areas where hazardous substances are handled, by diverting flow with berms and cut-off drains to divert stormwater runoff away from the site and discharge diverted stormwater as per pre-development conditions, and good house-keeping. – Clean solar panels with water that contains no chemicals. – Design stormwater management facilities to comply with regulation GN 704. – Stormwater infrastructure installed to mitigate possible hydrological impacts must be regularly maintained throughout the lifespan of the infrastructure to ensure its optimum functionality. – Apply erosion protection measures such as stonepitching downstream of steep roadside channels. – All pollution control mechanisms are to be in accordance with GN 704, and all necessary pollution control mechanisms must be protected and repaired or established when stockpiles or residue deposits are reclaimed, removed, or rehabilitated so that water pollution is minimized and abated. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
	Flooding In the operation phase, soil compaction and erosion may occur due to vehicle movement during routine maintenance. This activity w ill lead to an increase in impervious surfaces. This activity, how ever, will only occur occasionally and has therefore been considered to be infrequent and negligible.		✓		
Groundwater	**Groundwater Quantity** There are no groundwater quantity impacts identified during construction as water will not be obtained from the groundwater resource. Water for site	✓	✓	✓	– The Water Treatment Plant must be maintained to continue provision of water for site activities and the community.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	activities will be sourced from the existing Water Treatment Plant at Komati Power Station with no borehole abstraction required. During the operational phase the following impacts are expected: – Reduced recharge due to increase in hardstanding footprint. – Localised artificial recharge due to washing of solar panels.				– The low conductivity and low recharge will limit the migration of contamination to receptors. – Vehicles should be routinely inspected and maintenance carried out to reduce likelihood of spillages. – Parking should be on hardstanding. – Spill kits should be used to clean up spills when they occur. – Fuel storage areas should be located in hardstanding and bunded areas and pipelines regularly inspected to avoid leaks. – Potentially contaminated areas should be assessed and identified such that spoil received from trenches in these areas can be disposed in an appropriate manner. – All equipment that has the potential to leach contamination to the environment should be stored on hardstanding and in a bunded area (e.g. Fuel storage, soaps, greases, transformers etc). – Surface water controls to capture and contain wash water for re-use/management will reduce the impact to groundwater. – Vehicles should be routinely inspected and maintenance carried out to reduce likehood of spillages. – Redundant equipment must be demolished and removed to an appropriate waste facility. – Footprints should be re-assessed in terms of the Norms and Standards for Contaminated land and the areas managed accordingly. A remediation plan may be required depending on the outcome of the study. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
	Decrease In Groundwater Quality – Hydrocarbon spills from moving equipment and during maintenance. – Leachate/spills from fuel storage areas. – Spoil from excavated trenches may be contaminated and could leach to the groundwater. – Potential for soil contamination associated with potential release of environmental contaminants and hazardous substances (typically sewage/ portable toilet chemicals, cement, oil grease and fuel). – Localised increased leachate from contaminated soils due to water pooling from the washing of solar panels. The method of cleaning the solar panels is still being investigated	✓	✓	✓	
Soils and Land Capability	**Soil Erosion** Based on this desktop assessment, the site soils appear to be devoid of macrostructure and highly erodible. Some erosion will occur wherever soils	✓	✓	✓	– Soil erosion mitigation measures that should be considered include a phase-appropriate stormwater management plan, correct soil stripping, stockpiling and monitoring, with emphasis on quick revegetation of bare soils.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	are disturbed, especially if mitigation measures are not correctly implemented. The less structured soils will be more vulnerable to erosion compared to the more clay-rich soils. Soil erosion can lead to sedimentation of the watercourses within the vicinity of the site, and to the loss of arable soil, especially topsoil, for rehabilitation purposes. During the operational phase, the method of cleaning the solar panels is still being investigated however if washing of solar panels is required this will lead to soil erosion.				– Soil compaction cannot be fully mitigated against as compacted soil cannot regain its original structure. Soils can be ripped to make them more suitable for establishment of vegetation during rehabilitation – Soil compaction mitigation measures that should be considered include limiting vehicle routes on site by demarcating traffic areas and limiting vehicle access, and by stripping soils when they are dry. – Contamination mitigation measures that should be considered will include frequent vehicle maintenance, equipping onsite vehicles with drip trays, strict control of the potential contaminants entering the site and adequate waste disposal facilities on site.
	Soil Compaction Based on this desktop assessment, it appears that soils with signs of wetness will be present across the site. The more clay-rich soils identified on site will be more vulnerable to compaction compared to the sandier soils, and wet soils will be more vulnerable to compaction than the dry soils are. Soil compaction reduces the pore space available for air and water within soil, reducing soil arability and increasing the risk of soil erosion.	✓		✓	
	Soil Contamination The more clay-rich soils identified on site will be more vulnerable to contamination than the sandier soils will as the more clay-rich soils are more chemically active and will interact with the contaminants. All soils will be at risk of contamination, especially from hydrocarbons, as a result of the Project, especially during the construction phase.	✓		✓	
Terrestrial Biodiversity	**Direct loss and disturbance of habitat and associated flora Species of Conservation Concern** The proposed development areas largely fall within non-transformed areas however surrounded by farmlands and mining operations. Furthermore, the	✓			– Loss of habitat should be avoided by ensuring that proposed infrastructure/activities are situated outside of these areas. Should Natural habitat loss be unavoidable, net gain will need to be secured via an appropriately designed offset, to achieve the requirements of WB ESS6, as well as those of the DFFE.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	areas appear to lack the diversity of species and likely dominated by a single species. This will be investigated and confirmed during the EIA Phase.				— Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss must be addressed via additional conservation actions/offsets as required. — A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones. Further assessment will be undertaken during the EIA Phase to confirm this buffer. — To prevent loss of natural habitat (grasslands, wetlands) and flora SCC beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. — The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. — Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands. — A search and rescue survey for all flora SCC should then be conducted within these marked footprints prior to the commencement of construction to determine the number of potentially impacted plant species of conservation concern. Based on the findings of the survey, clearing and/or relocation permits should be obtained from the relevant authority to clear or rescue and relocate potentially impacted plant SCC. — Rescued plants should be relocated to an adjacent area of natural habitat.. — Glare reduction measures for PV panels and the use of safe perching devices and/or deterrents to reduce the risk of bird collision with panels or electrocution on associated powerline infrastructure should be implemented.
	Establishment And Spread Of Alien And Invasive Species Disturbances caused by vegetation clearing and earth works during construction and decomissioning will exacerbate the establishment and spread of alien invasive vegetation. Alien plant infestations can spread exponentially, suppressing, or replacing indigenous vegetation. This may result in a breakdown of ecosystem functioning and a loss of biodiversity. This will be investigated and confirmed during the EIA Phase.	✓		✓	
	Loss And Fragmentation Of Faunal Habitats The proposed development sites are surrounded by farmlands and mining operations, and as such remnant areas of fauna habitat restricted to wetlands/grasslands are already considered to be fragmented. This loss of landscape connectivity renders inhabiting populations of fauna isolated from other populations within the region. The LSA supports some potential habitat for Grass owl. This will be investigated and confirmed during the EIA Phase. The solar PV arrays will be fenced off for security purposes, which will present a barrier to movement for larger faunal species.	✓	✓		
	Injury and mortality of faunal species of conservation concern The bulk earthworks involved in site development and decomissioning have the potential to injure/kill individual faunal species of concern, particularly ground-dwelling and relatively slow-moving herpetofauna species that are vulnerable to heavy machinery movements and site clearance activities. However, the probability of the potential impact occurring is expected to be low given the transformed/disturbed nature of most available habitat. This will be investigated and confirmed during the EIA Phase.	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Increased vehicular traffic in the study area during the operation phase may pose a risk of injury and mortality of fauna SCC (and non-SCC). This will be investigated and confirmed during the EIA Phase.				– Speed limits should be expanded to construction areas via appropriate signage and enforced on all access roads to proposed new infrastructure locations. Dust suppression activities should also be expanded to include additional road at new infrastructure areas. – A search and rescue survey for herpetofauna species should be done immediately in advance of site clearance activities in non-transformed habitats (i.e. remnant grasslands and wetlands). Any observed individuals should be relocated to nearby areas of natural habitats. Where snakes require relocation, this should be done by a certified snake handler for health and safety reasons. – Dirty water resulting from construction and operational phases should not be allowed to freely flow on surfaces and or into the nearby watercourses and should be directed to the storm water management infrastructure (drains for example). – The development of a biodiversity management plan that provides a practical framework for the delivery of the preceding mitigation measures is recommended. – An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended.
	Spread of Alien and Invasive Species The potential establishment of alien invasive species in, and immediately adjacent to, the proposed development footprint will continue to be an impact of concern during all project phases as they can be entrained from workers and vehicles.	✓	✓	✓	
	Injury and mortality of bird species of conservation concern The presence of the Solar PV modules and ancillary infrastructure (particularly overhead transmission lines) in the landscape throughout the operational period may pose a risk of collision/electrocution to birds. This will be investigated and confirmed during the EIA Phase.		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
Aquatic Biodiversity	**Direct Loss of Wetland Habitat** Site establishment and construction of the proposed project infrastructure, particularly PV Site A which overlaps with seep 1, could lead to the permanent loss of wetland habitat within the project footprint.	✓			– Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss that cannot be avoided must be addressed via additional conservation actions/offsets as required. – A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones – To prevent loss of natural habitat in wetlands beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. – The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. – Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands. – Wetland/river crossings should be constructed utilizing designs that ensure that hydrological integrity of the affected wetlands is preserved, and natural flow regimes are maintained (i.e. no impoundment upstream of crossings, or flow concentration downstream of crossings. – Ideally construction activities within wetlands should take place in winter (during the dry season). Where summer construction is unavoidable, temporary diversions of the streams might be required. – Install erosion prevention measures prior to the onset of construction activities. Measures should include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible.
	Erosion The removal of wetland vegetation for the construction of the proposed development could result in an increase of bare soil/surfaces in the study area which could lead to increased runoff, ultimately resulting in soil erosion.	✓	✓		
	Establishment and Spread of AIS Disturbances caused by vegetation clearing and earth works during construction will exacerbate the establishment and spread of alien invasive vegetation. Alien plant infestations can spread exponentially, suppressing, or replacing indigenous vegetation. This may result in a breakdown of ecosystem functioning and a loss of wetland biodiversity. This will be investigated and confirmed during the EIA Phase.	✓	✓	✓	
	Catchment Land Use Changes and Activities Bulk earthworks involved in site development in the immediate catchment of wetlands have the potential to cause indirect impacts on wetland habitat through compaction/removal of recharge or interflow soils, as well as increased sediment deposition to downslope wetland ecosystems in stormwater runoff.	✓			
	Water quality deterioration and contamination of wetland soils		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Quarterly washing and maintenance of the PV panels could potentially have a negative impact on water quality and wetland soils, due to inputs of detergents, and possible erosion paths forming in the soils of adjacent wetland areas, should large amounts of water be discharged to the environment				– An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2011). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended. – Monitoring of wetland health to be conducted within one year of completion of construction, to measure any changes to the baseline status and ensure that recommended mitigation measures are sufficient to address any significant impacts. – Follow up monitoring of wetland health PES/EIS every three years throughout the operating period.
Heritage	**Disturbance to Known Cultural Resources** Construction activities may lead to disturbance or destruction of cultural resources (archaeological and historical remains and sacred sites e.g. graves) should the development footprint encroach on identified cultural/heritage sites.	✓			– Include a Chance and Find Procedure in EMSP – Ensure excavations and earthworks are conducted carefully to avoid damaging any potential heritage resources.
	Chance find of Cultural Resources Earthworks may accidentally expose unidentified subsurface fossil remains. This will result in a lost opportunity to preserve local cultural heritage and	✓			

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	historical records should appropriate management measures not be in place (e.g. Chance Find Procedure).				
Palaeontology	**Loss of fossil resources** If there is the presence of Karoo Supergroup strata there may be significant fossil resources that may be impacted by the development (mudstone, shale) and if destroyed are no longer available for scientific research or other public good.	✓			— If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped, a 30 m barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. — Include a Chance and Find Procedure in EMSP
Visual	**Visual Impacts on Motorists and Inhabitants** There will be some visual impacts on motorists and inhabitants during the construction and decommissioning periods resulting from laydown areas, construction vehicles, dust and equipment. These impacts will be transitory in nature for the duration of construction /decommissioning and include the following: — Potential visual intrusion resulting from large construction vehicles and equipment; — Potential visual effect of construction laydown areas and material stockpiles. — Potential impacts of increased dust emissions from construction activities and related traffic; — Potential visual scarring of the landscape as a result of site clearance and earthworks; and — Potential visual pollution resulting from littering on the construction site. Visual impact of the facility on observers in close proximity to the proposed Solar PV Energy Facility infrastructure and activities during operation will occur. Potential sensitive visual receptors include: — Residents of Komati and farm dwellings (if present in closer proximity to the facility) — Observers travelling along the R542 and R35 arterial roads	✓	✓	✓	— Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the EIA phase. — Carefully plan to minimise the construction period and avoid construction delays. — Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible. — Maintain a neat construction site by removing litter, rubble and waste materials regularly. — As far as possible, limit the amount of security and operational lighting present on site. — Light fittings for security at night should reflect the light toward the ground and prevent light spill (as far as possible). — Lighting fixtures should make use of minimum lumen or wattage (whilst adhering to relevant safety standards). — Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used (whilst adhering to relevant safety standards). — If economically and technically feasible, make use of motion detectors on security lighting. — Consider planting a treeline along the boundary of each facility to limit the infrastructure's visibility.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					– Ensure any buildings, containers or infrastructure are non-reflective and have a colour that blends into the surrounding landscape.
Traffic	**Increased traffic generation around the study area by construction vehicles** The construction and decomissioning phases are expected to generate additional traffic volumes on the local road network due to the transport of raw materials and machinery to site. The operational phase of the facility will require presence of staff personnel, except for those undertaking inspection, maintenance and repair works. The traffic impact on the surrounding roads will therefore be negligible.	✓	✓	✓	– The movement of vehicles into and out of the site must be managed such as ensuring that abnormal loads are moved outside of peak traffic hours. – Stagger component delivery to the site. – All drivers should comply with the relevant traffic laws and regulations. – Implement speed control by means of stop and go system and speed limit road signage. – Abnormal vehicle routes and management plans may be required dependant on the type and route of the abnormal vehicle loads. Abnormal vehicles may require special permits and route plans from the relevant road authority. These permits are the responsibility of the developer and its logistics/freight companies. – Undertake regular maintenance of gravel roads during the construction and decomissioning phases
	Deterioration of the surrounding road network due to an increase of traffic around the site Raw materials and machinery will be transported to the study area during the construction and decommisioning phase. This may result in potential damage to the existing road network. It is expected that the bulk of the construction plant would remain on site during construction. The impact of the heavy vehicles on the surrounding roads is considered to be negligible.	✓		✓	
	Transportation of abnormal loads The construction and decomissioning phase will result in impacts on roads users due to the need to transport over-sized components such as transformers. It is anticipated that the transport route(s) between the origin of the components and the facility may include national, provincial and local roads.	✓	✓	✓	
Social	**Economic Impact**	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES

	During the construction and decommissioning phases of the project, the Principal Engineer appointed by Eskom will require various goods and services. These requirements are likely to generate economic opportunities for local businesses. It is anticipated that the construction workforce (sourced from outside the surrounding communities) will be housed in local accommodations (guest houses or rental options) adding to the local economy. Provided that a significant proportion of money derived from wages earned would likely be spent in the vicinity of the project area, it is expected to create substantial flows of revenue within the surrounding communities, thus acting as a catalyst for growth in the formal and secondary economy. Additionally, workers sources from the surrounding communities are foreseen to spend an even larger proportion of their wages within the local communities further adding to the flows of revenue.
	
	The operational phase will see a decrease in available jobs as contractors leave the site for the site to be manned by limited operational workforce who in turn will lose their jobs during the decommissioning phase. This can lead to adverse social consequences in the municipality and labour sending area. There will be reduced local spending by Eskom and its staff and contractors. Consequently, local business revenue may be affected.
	
	There is a risk of health impact on the surrouding communities, although this is to a limited extent from the polluted dust generated during excavations and stockpiling activities on contaminated areas of the site.
					— Ensuring local communities (through formal channels such as ward councillors and Department of Labour) are made aware of the potential opportunities available during construction in order for expectations to be managed appropriately.
					— Prioritisation of local labour through implementing contractor policies.
					— Undertake a survey of industries and businesses in the local area to identify potential suppliers.
					— The developer and contractors must make HIV/AIDS awareness and prevention program development and implementation a condition of contract for all suppliers and sub-contractors.
					— Include OHS Requirements in the ESMP.
					— Include OHS Requirements in contract workers employment contracts.
					— Ensure an emergency response plan (ERP) is in place for all project phases. The ERP should cover:
					  — Roles and responsibilites
					  — Emergency communications and coordination
					  — Incident response procedure
					  — Potential risks (e.g. natural disasters, fire, site accidents and system failure).
					— Dust suppression must be conducted on the site to limit the potential impact of airborne pollutants from the excvated contaminated areas. Site personnel must also use normal dust masks during excavation and stockpiling activities.

	Community, Health and Safety Risk During construction and decommissioning, noise affects people in the surrounding communities differently, and the new noise which will be coming from the facilities. The activities of facilities can result in traffic and resources are being transported. Waste material that results from the activities could be detrimental to aesthetics and nearby community.	✓		✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Social ills may also increase in the area with the proposed activities known to result in an influx of people from further afield seeking employment opportunities. The limited opportunities may result in increased unemployment in the area and thus increased crime. Construction and decommissioning activities can be take much longer than initially planned at the beginning of a project. This can result in extended stays away from home for the labourers, who are generally men, and this may lead to an increase in the night economy.				
	Health and Safety of Site Personnel There are potential health and safety risks to site personnel such as: – Man-Vehicle interactions – Fire hazards – Physical injuries – Health impact due to airbone pollutants released during excavations and stockpiling.	✓	✓	✓	
	Low Carbon Power Generation During the operational phase of the project, no waste or emissions will be produced by the facility. South Africa's per capita greenhouse emissions are the highest in Africa thus this project will aid in reducing the carbon footprint and emissions of the country.		✓		
	Impact on the community The change in the landscape/view within the community and the increased presence of construction workers may lead to a decreased sense of place/belonging for the residents of the area.		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	The proposed location of the Solar PV Panels and BESS facilities are not within any formal or informal communities. The displacement of communtiies is therefore not likely to occur.				
	Employment and Business Opportunities The maintenance of the facility and functioning of the facility will create employment. It is assumed that the unskilled labour will be sourced from the local community and that skilled labour, within reason, will be sourced from the local communities as well.		✓		

C: Construction

O: Operation

D: Decommissioning

7 IMPACT SIGNIFICANCE

7.1 DRAFT EIA IMPACT SIGNIFICANCE ASSESSMENT

This section provides an overview of the likely significance of construction phase (**Table 7.1**), operational phase (**Table 7.2**) and decommissioning phase (**Table 7.3**). This is used as a guide to determine whether additional assessment may be required in the EIA phase. Impacts will be refined and assessed during the EIA phase.

Table 7.1: Potential Construction Phase Impacts

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Air Quality	Dust and Particulate Emissions	Negative	3	1	**Low**	**No**
Noise	Increase in construction noise levels	Negative	3	1	**Low**	**No**
Surface Water	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	
Groundwater	Decrease in groundwater quality due to hydrocarbon spills from moving equipment	Negative	3	1	**Low**	**No**
	Decrease in groundwater quality due to leachate/spills from fuel storage areas	Negative	3	1	**Low**	
	Decrease in groundwater quality due to contaminated soil that could leach to the groundwater	Negative	3	1	**Low**	**Yes**
Soils and Land Capability	Soil Erosion	Negative	3	2	**Medium**	**Yes**
	Soil Compaction	Negative	4	3	**High**	
	Soil Contamination	Negative	2	2	**Medium**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Terrestrial Biodiversity	Direct Loss and disturbance of natural habitat and associated flora SCC	Negative	3	2	**Medium**	**Yes**
	Establishment and spread of AIS	Negative	3	2	**Medium**	
	Loss and fragmentation of faunal habitat	Negative	2	3	**Medium**	
	Injury and mortality of fauna SCC	Negative	3	1	**Low**	
Aquatic Biodiversity	Direct loss of wetland habitat	Negative	4	4	**High**	**Yes**
	Erosion	Negative	3	3	**Medium**	
	Establishment and spread of AIS	Negative	3	2	**Medium**	
	Catchment land use changes and activities	Negative	3	3	**Medium**	
Heritage	Disturbance to Known Cultural Resources	Negative	1	2	**Very Low**	**Yes**
	Chance-find of Cultural Resources	Negative	1	2	**Very Low**	
Palaeontology	Loss of fossil resources	Negative	1	2	**Very Low**	
Visual	Potential visual intrusion resulting from large construction vehicles and equipment	Negative	3	2	**Medium**	**Yes**
	Potential visual effect of construction laydown areas and material stockpiles.	Negative	3	2	**Medium**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	Potential impacts of increased dust emissions from construction activities and related traffic	Negative	3	2	**Medium**	
	Potential visual scarring of the landscape as a result of site clearance and earthworks	Negative	3	2	**Medium**	
	Potential visual pollution resulting from littering on the construction site	Negative	3	1	**Low**	
Traffic	Impact of construction vehicles on roads and access roads	Negative	3	1	**Low**	**Yes**
Social	Economic Impact	Positive	4	2	**Medium**	**Yes**
	Community, Health and Safety Risk	Negative	3	2	**Medium**	

Table 7.2: Potential Operational Phase Impacts

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Surface water	Flooding	Negative	2	2	**Low**	**Yes**
	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	**Yes**
Groundwater	Reduced recharge due to increase in hardstanding footprint	Negative	3	1	**Low**	**No**
	Localised artificial recharge due to washing of solar panels	Negative	3	1	**Low**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	Reduced leachate from contaminated soils	Positive	3	2	**Medium**	
	Localised leachate from equipment	Negative	3	2	**Medium**	
	Localised increased leachate from contaminated soils due to following washing of solar panels	Negative	3	2	**Medium**	**Yes**
Terrestrial Biodiversity	Establishment and spread of AIS	Negative	3	2	**Medium**	**Yes**
	Fragmentation of fauna habitats/barriers to movement	Negative	2	2	**Low**	**Yes**
	Electrocution of bird SCC	Negative	3	2	**Medium**	**Yes**
	Injury and mortality of fauna SCC	Negative	3	1	**Low**	**Yes**
Aquatic Biodiversity	Catchment land use changes and activities	Negative	3	3	**Medium**	**Yes**
	Habitat quality reductions due to stormwater runoff, land use changes	Negative	3	2	**Medium**	
	Spread of AIS	Negative	3	3	**Medium**	
	Increased run-off, Erosion	Negative	3	3	**Medium**	
	Water quality deterioration and contamination of wetland soils	Negative	3	3	**Medium**	
Visual	Viewing of the PV facility infrastructure and activities	Negative	2	3	**Medium**	**Yes**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Social	Low Carbon Power Generation	Positive	4	2	**Medium**	**Yes**
	Impact on the community	Negative	4		**Medium**	
	Employment and Business Opportunities	Positive	4	2	**Medium**	

Table 7.3: Potential Decommissioning Phase Impacts

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Air Quality	Dust and Particulate Emissions	Negative	3	1	**Low**	**No**
Noise	Increase in construction noise levels	Negative	3	1	**Low**	**No**
Surface Water	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	
Groundwater	Decrease in groundwater quality due to hydrocarbon spills from moving equipment	Negative	3	1	**Low**	**No**
	Decrease in groundwater quality due to leachate/spills from equipment no longer in use	Negative	3	2	**Medium**	
Soils and Land Capability	Soil Erosion	Negative	3	2	**Medium**	**Yes**
	Soil Compaction	Negative	4	3	**High**	
	Soil Contamination	Negative	2	2	**Medium**	
Terrestrial Biodiversity	Establishment and spread of AIS	Negative	3	2	**Medium**	**Yes**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Aquatic Biodiversity	Erosion	Negative	3	3	**Medium**	**Yes**
	Establishment and spread of AIS	Negative	3	2	**Medium**	
Visual	Potential visual intrusion resulting from large construction vehicles and equipment	Negative	3	2	**Medium**	**Yes**
	Potential visual effect of construction laydown areas and material stockpiles.	Negative	3	2	**Medium**	
	Potential impacts of increased dust emissions from construction activities and related traffic	Negative	3	2	**Medium**	
	Potential visual scarring of the landscape as a result of site clearance and earthworks	Negative	3	2	**Medium**	
	Potential visual pollution resulting from littering on the construction site	Negative	3	1	**Low**	
Traffic	Impact of construction vehicles on roads and access roads	Negative	3	1	**Low**	**Yes**
Social	Loss of employment	Negative	4	3	**High**	**Yes**
	Reduced community investment	Negative	4	3	**High**	

7.2 PROPOSED MITIGATION MEASURES

The possible mitigation measures that could be applied to the potential impacts identified in **Section 7.1** are shown in **Table 7.4**, **Table 7.5**, and **Table 7.6.** These mitigation measures are preliminary and will be refined during the EIA Phase where the specialists will undertake detailed impact assessments.

Table 7.4: Proposed Mitigation Measures for Construction Phase Impacts

ASPECT	MITIGATION MEASURES
Air Quality	— Information regarding construction activities should be shared with all local communities (such as the Komati Village). — Complaint's register must be kept to record all events. — When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. — Speed limits (approximately 20-40 km/hr) can be enforced to control open dust sources. — Wind speed reduction is a common method used to control open dust sources at construction sites as wind barriers and windbreaks tend to be readily available. It is also recommended to cease high dust construction activities, for e.g. land-clearing, during high wind speed events. — Application of water can be used to reduce dust emissions.
Noise	— Planning construction activities in consultation with local communities (such as the Komati Village) so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. — When working near a potential sensitive receptor (within 100 m), limit the number of simultaneous activities to a minimum as far as possible. — Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines. — Selecting equipment with the lowest possible sound power levels. — Ensuring equipment is well-maintained to avoid additional noise generation. — A drop height policy should be implemented onsite to reduce the level of noise generation when handling materials. All equipment operators should be trained in the policy such that drop height reduction is implemented onsite. — It is recommended that a maximum speed of 20-40 km/h should be set on all unpaved roads. — Ensure a reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement. — Encouraging the receipt of materials during non-peak traffic hours to avoid traffic build-up and associated noise. — Vehicles should not be allowed to idle for more than five minutes when not in use.
Surface water	— Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site. — After construction, the land must be cleared of debris, surplus materials, and equipment. All parts of the land must be left in a condition as close as possible to that prior to construction. — Avoid clearing during the wet season when short heavy downpours can be expected. This should help to limit erosion. — Minimize the extent of earthworks.

ASPECT	MITIGATION MEASURES
	— Encourage the use of natural flow paths downstream of construction sites. — The discharge of stormwater should be spread over a wide area to reduce the energy as a result of concentrated flow and return to dispersed flow downstream of the construction site. — Re-use stockpiled soil within as short a period as possible. — Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
Groundwater	— The Water Treatment Plant must be maintained to continue provision of water for site activities and the community. — The low conductvity and low recharge will limit the migration of contamination to receptors. — Vehicles should be routinely inspected and maintenance carried out to reduce likelihood of spillages. — Parking should be on hardstanding. — Spill kits should be used to clean up spills when they occur. — Fuel storage areas should be located in hardstanding and bunded areas and pipelines regularly inspected to avoid leaks. — Potentially contaminated areas should be assessed and identified such that spoil received from trenches in these areas can be disposed in an appropriate manner. — All equipment that has the potential to leach contamination to the environment should be stored on hardstanding and in a bunded area (e.g. Fuel storage, soaps, greases, transformers etc). — Surface water controls to capture and contain wash water for re-use/management will reduce the impact to groundwater. — Vehicles should be routinely inspected and maintenance carried out to reduce likehood of spillages. — Spill kits should be used to clean up spills when they occur. — Footprints should be re-assessed in terms of the Norms and Standards for Contaminated land and the areas managed accordingly. A remediation plan may be required depending on the outcome of the study. — Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
Soils and Land Capability	— Soil erosion mitigation measures that should be considered include a phase-appropriate stormwater management plan, correct soil stripping, stockpiling and monitoring, with emphasis on quick revegetation of bare soils. — Soil compaction cannot be fully mitigated against as compacted soil cannot regain its original structure. Soils can be ripped to make them more suitable for cultivation, however. Soil compaction mitigation measures that should be considered include limiting vehicle routes on site by demarcating traffic areas and limiting vehicle access, and by stripping soils when they are dry. — Contamination mitigation measures that should be considered will include frequent vehicle maintenance, equipping onsite vehicles with drip trays, strict control of the potential contaminants entering the site and adequate waste disposal facilities on site.

ASPECT	MITIGATION MEASURES
Terrestrial Biodiversity	– Loss of habitat should be avoided by ensuring that proposed infrastructure/activities are situated outside of these areas. Should Natural habitat loss be unavoidable, net gain will need to be secured via an appropriately designed offset, to achieve the requirements of WB ESS6, as well as those of the DFFE. – Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss must be addressed via additional conservation actions/offsets as required. – A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones. Further assessment will be undertaken during the EIA Phase to confirm this buffer. – To prevent loss of natural habitat (grasslands, wetlands) and flora SCC beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. – The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. – Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands. – A search and rescue survey for all flora SCC should then be conducted within these marked footprints prior to the commencement of construction to determine the number of potentially impacted plant species of conservation concern. Based on the findings of the survey, clearing and/or relocation permits should be obtained from the relevant authority to clear or rescue and relocate potentially impacted plant SCC. – Rescued plants should be relocated to an adjacent area of natural habitat.. – Glare reduction measures for PV panels and the use of safe perching devices and/or deterrents to reduce the risk of bird collision with panels or electrocution on associated powerline infrastructure should be implemented. – Speed limits should be expanded to construction areas via appropriate signage and enforced on all access roads to proposed new infrastructure locations. Dust suppression activities should also be expanded to include additional road at new infrastructure areas. – A search and rescue survey for herpetofauna species should be done immediately in advance of site clearance activities in non-transformed habitats (i.e. remnant grasslands and wetlands). Any observed individuals should be relocated to nearby areas of natural habitats. Where snakes require relocation, this should be done by a certified snake handler for health and safety reasons. – Dirty water resulting from construction and operational phases should not be allowed to freely flow on surfaces and or into the nearby watercourses and should be directed to the storm water management infrastructure (drains for example). – The development of a biodiversity management plan that provides a practical framework for the delivery of the preceding mitigation measures is recommended. – An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread

ASPECT	MITIGATION MEASURES
	of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended.
Aquatic Biodiversity	– Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss that cannot be avoided must be addressed via additional conservation actions/offsets as required. – A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones – To prevent loss of natural habitat in wetlands beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. – The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. – Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands. – Wetland/river crossings should be constructed utilizing designs that ensure that hydrological integrity of the affected wetlands is preserved, and natural flow regimes are maintained (i.e. no impoundment upstream of crossings, or flow concentration downstream of crossings. – Ideally construction activities within wetlands should take place in winter (during the dry season). Where summer construction is unavoidable, temporary diversions of the streams might be required. – Install erosion prevention measures prior to the onset of construction activities. Measures should include low berms on approach and departure slopes to crossings to prevent flow concentration, sediment barriers along the lower edge of bare soil areas, placement of hay bales around the within wetland construction areas, and re-vegetation of disturbed areas as soon as possible.
Heritage	– Include a Chance and Find Procedure in EMSP – Ensure excavations and earthworks are conducted carefully to avoid damaging any potential heritage resources.
Palaeontology	– If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped, a 30 m barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. – Include a Chance and Find Procedure in EMSP

ASPECT	MITIGATION MEASURES
Visual	— Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the EIA phase. — Carefully plan to minimise the construction period and avoid construction delays. — Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible. — Maintain a neat construction site by removing litter, rubble and waste materials regularly. — Consider planting a treeline along the boundary of each facility to limit the infrastructure's visibility. — Ensure any buildings, containers or infrastructure are non-reflective and have a colour that blends into the surrounding landscape.
Traffic	— The movement of vehicles into and out of the site must be managed such as ensuring that abnormal loads are moved outside of peak traffic hours. — Stagger component delivery to the site. — All drivers should comply with the relevant traffic laws and regulations. — Implement speed control by means of stop and go system and speed limit road signage. — Abnormal vehicle routes and management plans may be required dependant on the type and route of the abnormal vehicle loads. Abnormal vehicles may require special permits and route plans from the relevant road authority. These permits are the responsibility of the developer and its logistics/freight companies. — Undertake regular maintenance of gravel roads during the construction and decomissioning phases

Social	— Ensuring local communities (through formal channels such as ward councillors and Department of Labour) are made aware of the potential opportunities available during construction in order for expectations to be managed appropriately.
	— Prioritisation of local labour through implementing contractor policies.
	— Undertake a survey of industries and businesses in the local area to identify potential suppliers.
	— The developer and contractors must make HIV/AIDS awareness and prevention program development and implementation a condition of contract for all suppliers and sub-contractors.
	— Include OHS Requirements in the ESMP.
	— Include OHS Requirements in contract workers employment contracts.
	— Ensure an emergency response plan (ERP) is in place for all project phases. The ERP should cover:
	  — Roles and responsibilites
	  — Emergency communications and coordination
	  — Incident response procedure
	  — Potential risks (e.g. natural disasters, fire, site accidents and system failure).
	— Dust suppression must be conducted on the site to limit the potential impact of airborne pollutants from the excvated

ASPECT	MITIGATION MEASURES
	contaminated areas. Site personnel must also use normal dust masks during excavation and stockpiling activities.

Table 7.5: Proposed Mitigation Measures for Operational Phase Impacts

ENVIRONMENT	MITIGATION MEASURES
Noise	– Ensuring equipment is well-maintained to avoid additional noise generation.
Surface water	– Protect structures such as the solar PV bases and substation / control building from localised flooding by constructing cut-off berms / diverting flow on the uphill side in flood prone areas. – Prevent stormwater runoff to come in contact with dedicated areas where hazardous substances are handled, by diverting flow with berms and cut-off drains to divert stormwater runoff away from the site and discharge diverted stormwater as per pre-development conditions, and good house-keeping. – Clean solar panels with water that contains no chemicals. – Design stormwater management facilities to comply with regulation GN 704. – Stormwater infrastructure installed to mitigate possible hydrological impacts must be regularly maintained throughout the lifespan of the infrastructure to ensure its optimum functionality. – Apply erosion protection measures such as stonepitching downstream of steep roadside channels. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
Groundwater	– The Water Treatment Plant must be maintained as proposed by Component C to continue provision of water for site activities and the community. – Ensure panels are washed with water free of contaminanets. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
Terrestrial Biodiversity	– Glare reduction measures for PV panels and the use of safe perching devices and/or deterrents to reduce the risk of bird collision with panels or electrocution on associated powerline infrastructure should be implemented. – Dirty water resulting from construction and operational phases should not be allowed to freely flow on surfaces and or into the nearby watercourses and should be directed to the storm water management infrastructure (drains for example). – The development of a biodiversity management plan that provides a practical framework for the delivery of the preceding mitigation measures is recommended. – An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both

ENVIRONMENT	MITIGATION MEASURES
	chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended.
Aquatic Biodiversity	– An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2011). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended. – Monitoring of wetland health to be conducted within one year of completion of construction, to measure any changes to the baseline status and ensure that recommended mitigation measures are sufficient to address any significant impacts. – Follow up monitoring of wetland health PES/EIS every three years throughout the operating period.
Visual	– Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the EIA phase. – As far as possible, limit the amount of security and operational lighting present on site. – Light fittings for security at night should reflect the light toward the ground and prevent light spill (as far as possible). – Lighting fixtures should make use of minimum lumen or wattage (whilst adhering to relevant safety standards). – Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used (whilst adhering to relevant safety standards). – If economically and technically feasible, make use of motion detectors on security lighting. – Consider planting a treeline along the boundary of each facility to limit the infrastructure's visibility. – Ensure any buildings, containers or infrastructure are non-reflective and have a colour that blends into the surrounding landscape.

Table 7.6 Proposed Mitigation Measures for Decomissioning Phase Impacts

ASPECT	MITIGATION MEASURES
Air Quality	– Information regarding construction and decomissioning activities should be shared with all local communities (such as the Komati Village). – Complaint's register must be kept to record all events. – When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. – Speed limits (approximately 20-40 km/hr) can be enforced to control open dust sources. – Wind speed reduction is a common method used to control open dust sources at construction sites as wind barriers and windbreaks tend to be readily available. It is also recommended to cease high dust construction activities, for e.g. land-clearing, during high wind speed events. – Application of water can be used to reduce dust emissions.
Noise	– Planning construction and decomissioning activities in consultation with local communities (such as the Komati Village) so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. – When working near a potential sensitive receptor (within 100 m), limit the number of simultaneous activities to a minimum as far as possible. – Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines. – Selecting equipment with the lowest possible sound power levels. – Ensuring equipment is well-maintained to avoid additional noise generation. – A drop height policy should be implemented onsite to reduce the level of noise generation when handling materials. All equipment operators should be trained in the policy such that drop height reduction is implemented onsite. – It is recommended that a maximum speed of 20-40 km/h should be set on all unpaved roads. – Ensure a reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement. – Vehicles should not be allowed to idle for more than five minutes when not in use.
Surface water	– Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site. – Avoid clearing during the wet season when short heavy downpours can be expected. This should help to limit erosion. – Encourage the use of natural flow paths downstream of construction sites. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is

ASPECT	MITIGATION MEASURES
	issued, the monitoring programme must be updated to comply with the new WUL.
Groundwater	– The Water Treatment Plant must be maintained to continue provision of water for site activities and the community. – Parking should be on hardstanding. – Fuel storage areas should be located in hardstanding and bunded areas and pipelines regularly inspected to avoid leaks. – All equipment that has the potential to leach contamination to the environment should be stored on hardstanding and in a bunded area (e.g. Fuel storage, soaps, greases, transformers etc). – Surface water controls to capture and contain wash water for re-use/management will reduce the impact to groundwater. – Vehicles should be routinely inspected and maintenance carried out to reduce likehood of spillages. – Spill kits should be used to clean up spills when they occur. – Monitoring to continue as per Komati Power Station's current WUL requirements and align with the WB ESS. If a new WUL is issued, the monitoring programme must be updated to comply with the new WUL.
Soils and Land Capability	– Soil erosion mitigation measures that should be considered include a phase-appropriate stormwater management plan, correct soil stripping, stockpiling and monitoring, with emphasis on quick revegetation of bare soils. – Soil compaction mitigation measures that should be considered include limiting vehicle routes on site by demarcating traffic areas and limiting vehicle access, and by stripping soils when they are dry.
Terrestrial Biodiversity	– Loss of habitat should be avoided by ensuring that proposed infrastructure/activities are situated outside of these areas. Should Natural habitat loss be unavoidable, net gain will need to be secured via an appropriately designed offset, to achieve the requirements of WB ESS6, as well as those of the DFFE. – Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss must be addressed via additional conservation actions/offsets as required. – A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones. Further assessment will be undertaken during the EIA Phase to confirm this buffer. – To prevent loss of natural habitat (grasslands, wetlands) and flora SCC beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. – The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. – Locate all laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands. – Speed limits should be expanded to construction areas via appropriate signage and enforced on all access roads to proposed new infrastructure locations. Dust suppression activities should

ASPECT	MITIGATION MEASURES
	also be expanded to include additional road at new infrastructure areas. – The development of a biodiversity management plan that provides a practical framework for the delivery of the preceding mitigation measures is recommended. – An alien and invasive species management plan should be developed for the Project, which includes details of strategies and procedures that must be implemented on site to control the spread of alien and invasive species. A combined approach using both chemical and mechanical control methods, with periodic follow-up treatments informed by regular monitoring, is recommended. – Specific provision for biodiversity conservation, including details of any required offsets, should be made in the project BMP/BAP, in alignment with the objectives of the MBSP (2019). – Inclusion of a practical framework and schedule, details of key performance indicators, and recommended monitoring protocols for the delivery of existing and currently recommended mitigation measures in the BMP is recommended.
Aquatic Biodiversity	– Areas of undisturbed, natural grassland and wetland habitat should be avoided to the extent possible. Areas of direct loss that cannot be avoided must be addressed via additional conservation actions/offsets as required. – A loss/disturbance buffer zone of at least 100 m should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones – To prevent loss of natural habitat in wetlands beyond the direct disturbance footprint, prior to any vegetation clearing, the development footprints should be clearly marked out with flagging tape/posts in the field. Vegetation clearing should be restricted to the proposed project footprints only, with no clearing permitted outside of these areas. – The extent of disturbance should be limited by restricting all construction activities to the servitude as far as practically possible. – Locate all laydown areas and temporary construction infrastructure at least 50 m from the edge of delineated wetlands.
Visual	– Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the EIA phase. – Carefully plan to minimise the decomossioning period and avoid delays. – Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible. – Maintain a neat site by removing litter, rubble and waste materials regularly.

ASPECT	MITIGATION MEASURES
Traffic	— The movement of vehicles into and out of the site must be managed such as ensuring that abnormal loads are moved outside of peak traffic hours. — All drivers should comply with the relevant traffic laws and regulations. — Implement speed control by means of stop and go system and speed limit road signage. — Abnormal vehicle routes and management plans may be required dependant on the type and route of the abnormal vehicle loads. Abnormal vehicles may require special permits and route plans from the relevant road authority. These permits are the responsibility of the developer and its logistics/freight companies. — Undertake regular maintenance of gravel roads during the construction and decomissioning phases

Social	— Ensuring local communities (through formal channels such as ward councillors and Department of Labour) are made aware of the potential opportunities available during construction/decommissioning in order for expectations to be managed appropriately.
	— Prioritisation of local labour through implementing contractor policies.
	— The developer and contractors must make HIV/AIDS awareness and prevention program development and implementation a condition of contract for all suppliers and sub-contractors.
	— Include OHS Requirements in the ESMP.
	— Include OHS Requirements in contract workers employment contracts.
	— Ensure an emergency response plan (ERP) is in place for all project phases. The ERP should cover:
	  — Roles and responsibilites
	  — Emergency communications and coordination
	  — Incident response procedure
	  — Potential risks (e.g. natural disasters, fire, site accidents and system failure).

7.3 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the Solar PV and BESS facilities on the receiving environment is expected to be minimal. The cumulative impacts are as follows:

- **Terrestrial Biodiversity:**
  - The landscape within which the proposed infrastructure is located is heavily to moderately modified and fragmented as a consequence of the existing mining operations, farmlands and residential areas. While the currently proposed project infrastructure largely avoids the loss of significant areas of natural habitat and associated flora SCC due to active avoidance of these areas as part of the ongoing planning process, vegetation clearing would result in loss of additional species and habitats of conservation concern, contributing to cumulative impacts in terms of direct losses of these receptors.
- **Aquatic Biodiversity:**
  - The landscape within which the proposed infrastructure is located is almost completely modified and fragmented as a consequence of the existing surrounding land uses (i.e., power station, mining,

agricultural practices, residential areas, and informal settlement). While the currently proposed project infrastructure largely avoids the loss of significant areas of natural habitat due to active avoidance of these areas as part of the ongoing planning process, vegetation clearing would result in loss of additional 24.5 ha of moderately/largely modified seep habitats (Seep 1), contributing to cumulative impacts in terms of direct loss of seep wetlands at the landscape level.

- **Bats:**
  - Several bats roosts being destroyed can impact bat populations of affected species over a larger area. Bat mortalities over long periods of time can negatively impact species genetic diversity in a population. If this occurs over a larger area of several wind farms, it decreases the chances of bat populations recovering to a prior state. Bats play an important role in controlling insect numbers, certain species of insects may increase in numbers over a larger area if bats are negatively impacted.
- **Visual:**
  - Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially alter the sense of place and visual character of the area.

The potential cumulative social impacts are as follows:

- **Visual impacts**
  - The proposed development will change the aesthetics of the project area. Construction activities, dust mobilisation and construction vehicles traversing the proposed site, as well as the presence of new infrastructure will transform the landscape. The solar panels and wind turbines will be visually prominent from several vantage points.
- **Sense of Place**
  - The potential cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. The relevant issues identified by Scottish Natural Heritage study include:
    - Combined visibility (whether two or more wind farms will be visible from one location).
    - Sequential visibility (e.g., the effect of seeing two or more wind farms along a single journey, e.g., road or walking trail).
    - The visual compatibility of different wind farms in the same vicinity.
    - Perceived or actual change in land use across a character type or region.
    - Loss of a characteristic element (e.g., viewing type or feature) across a character type caused by developments across that character type.
- **Employment**
  - One of the positive short-term social impacts will be the creation of jobs. Construction activities will create several temporary employment opportunities. Other social impacts include the increased demand on local services, the influx of job seekers, social problems arising from population increase in the area, change in land use and the effect on sense of place.
- **Traffic**
  - Transportation of construction materials and workers to the proposed site, during the construction phase is anticipated to have a significant impact on the condition of the transportation infrastructure and traffic volumes in the area. Additional heavy construction vehicles have the potential to damage roads, create noise, dust, and cause risks impacts for other road users and residents in the area.
- **Economic benefits**
  - Increased expenditure during the construction of the proposed facility will contribute to the local economy. The income of the workers will also increase spending in the local community and thus stimulate the formal and informal sectors and secondary industries, having a positive multiplier effect.
  - The local businesses used will be skilled in the construction of solar facilities leading to a wider range of opportunities for the business and its workers.

8 PLAN OF STUDY FOR THE EIA

8.1 PLAN OF STUDY FOR EIA TERMS OF REFERENCE

Table 8.1 outlines the structure of the plan of study as required in terms of Annexure 2 of GNR 982.

Table 8.1: Plan of Study Requirements

PLAN OF STUDY CHAPTER	INFORMATION REQUIREMENT AS PER GNR 982
Description of EIA Tasks	— A description of the tasks that will be undertaken as part of the environmental impact assessment process.
Description of Alternatives	— A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
Aspects to be Assessed in the EIA Process	— A description of the aspects to be assessed as part of the environmental impact assessment report process.
Specialist Studies	— Aspects to be assessed by specialists.
Impact Assessment Methodology	— A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists. — A description of the proposed method of assessing duration and significance.
Environmental Impact Report	— Contents of EIAR as specified in GNR 982 (as amended) Annexure 2
Stakeholder and Authority Engagement	— An indication of the stages at which the competent authority will be consulted. — Particulars of the public participation process that will be conducted during the environmental impact assessment process.

8.2 OVERVIEW OF THE EIA PHASE TASKS

The EIA phase will consist of the following tasks; each of these tasks is detailed separately in the following sub-sections:

- Specialist studies;
- Continuation of authority and stakeholder engagement;
- Assessment of the significance of potential impacts; and
- Preparation of the EIA Report.

8.3 DESCRIPTION OF ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives, which relate to the site, technology and process alternatives
- Detailed Level Alternatives which relate to working methods and mitigation measures

The feasibility of the higher-level concept alternatives have been considered and assessed within **Section 4.6** of this report. The Detailed Level Alternatives will be addressed within the EIA Report.

8.4 ASPECTS TO BE ASSESSED IN THE EIA PROCESS

Table 8.2 outlines the key aspects that were identified in the scoping phase; these aspects will be subject to further assessment in the EIA Phase.

Table 8.2: Summary of aspects to be addressed in the EIA Phase

ENVIRONMENTAL ASPECT	IMPACT
Air Quality	Dust And Particulate Emissions
Noise	Increase In Construction Noise Levels
Surface water	Stormwater Runoff
	Erosion
	Flooding
	Stormwater Runoff
	Cumulative Impacts
Groundwater	Groundwater Quantity
	Decrease In Groundwater Quality
Soils and Land Capability	Soil Erosion
	Soil Compaction
	Soil Contamination
Terrestrial Biodiversity	Direct loss and disturbance of natural habitat and associated flora Species of Conservation Concern
	Establishment And Spread Of Alien And Invasive Species
	Loss And Fragmentation Of Faunal Habitats
	Injury and mortality of faunal species of conservation concern
Aquatic Biodiversity	Direct Loss of Wetland Habitat
	Erosion
	Establishment and Spread of AIS
	Catchment Land Use Changes and Activities

ENVIRONMENTAL ASPECT	IMPACT
	Water quality deterioration and contamination of wetland soils
Heritage	Disturbance to Known Cultural Resources
	Chance find of Cultural Resources
Palaeontology	Loss of fossil resources
Visual	Visual Impacts on Motorists and Inhabitants
	Viewing of the PV facility infrastructure and activities
Traffic	Increased traffic generation around the study area by construction vehicles
	Deterioration of the surrounding road network due to an increase of traffic around the site
	Transportation of abnormal loads during the construction phase
Social	Economic Impact
	Community, Health and Safety Risk
	Low Carbon Power Generation
	Impact on the community
	Employment and Business Opportunities
	Loss of employment
	Reduced community investment

8.5 SPECIALIST STUDIES TO BE UNDERTAKEN

The following specialist assessments have been commissioned for the EIA Phase:

- Surface Water Impact Assessment;
- Groundwater Impact Assessment;
- Soil Impact Assessment;
- Terrestrial Biodiversity Impact Assessment
- Avifauna Assessment;
- Aquatic Biodiversity Impact Assessment;
- Heritage Impact Assessment;
- Palaeontological Impact Assessment;

- Visual Impact Assessment;
- Traffic Impact Assessment; and
- Social Impact Assessment.

It should be noted that the specialist studies will be undertaken according to the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and Section 44 of the NEMA (GNR 320, dated 20 March 2020), where applicable.

8.5.1 SURFACE WATER IMPACT ASSESSMENT

A detailed surface water impact assessment will be undertaken during the EIA phase that will include:

- Assessment of water quality changes;
- Assessment of hydrology (stormwater management);
- Assessment of the potential impacts, based on the supplied methodology;
- Assessment of the cumulative impacts of the proposed development;
- Provide mitigations regarding project related impacts; and
- Provide the relevant aspects with regard compiling the Environmental Management / Monitoring Plans.

8.5.2 GROUNDWATER IMPACT ASSESSMENT

The groundwater study will be updated during the EIA phase to include the following:

- Data from the contaminated land investigation;
- Refinement of impacts; and
- Proposed mitigation measures regarding the project related impacts.

8.5.3 SOIL IMPACT ASSESSMENT

A detailed Soils and Land Capability Impact Assessment will be undertaken during the EIA phase. This would include a free format soils classification survey of the study area, a soil capability assessment and a detailed impact assessment.

8.5.4 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

A detailed Terrestrial Biodiversity Assessment will be undertaken during the EIA phase. This would inlcude the following:

- Additional baseline data gathering surveys and impact assessments, which will include the following:
  - Terrestrial fauna surveys (focussing on mammal and herpetofauna SCC with potential to occur in the LSA) will be done later in 2022 (wet season)
  - Vegetation mapping and flora surveys (focussing on the identification of any flora SCC with potential to occur in the LSA, and mapping of AIS) will be done during late October 2022 (wet season).
  - Avifauna Specialist Assessment:
  - A comprehensive field survey will be conducted during a single, 5 day, peak season survey, and will include sample counts of small terrestrial species, counts of large terrestrial species and raptors, focal site surveys and incidental observations.
  - The Avifaunal Impact Assessment Report will be compiled within one month upon completion of the field survey and analysis of the primary field data, and will contain full analysis of the findings.

8.5.5 AVIFAUNA IMPACT ASSESSMENT

A detailed Avifauna Assessment will be undertaken during the EIA phase. This would inlcude the following:

- A comprehensive field survey will be conducted during a single, 5 day, peak season survey, and will include sample counts of small terrestrial species, counts of large terrestrial species and raptors, focal site surveys and incidental observations.
- The Avifaunal Impact Assessment Report will be compiled within one month upon completion of the field survey and analysis of the primary field data, and will contain full analysis of the findings.

8.5.6 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

A detailed Aquatic Biodiversity Assessment would need to be undertaken during the EIA phase. This would inlcude the following:

- Update of the wetland baseline description with scientifically-determined buffer zones, and revision of the EIS scores in the context of the completed flora and fauna study findings, as required.
- Diatom sample results and analysis.
- Updated impact assessment, using NEMA-prescribed methods.
- Finalised mitigation measures for inclusion in the Project EMP.

8.5.7 HERITAGE AND PALAEONTOLOGICAL IMPACT ASSESSMENT

The scoping study did not identify any fatal flaws for the proposed project. A field-based Heritage Impact Assessment, as defined in section 38 of the NHRA, will be undertaken during the EIA phase of the assessment. The HIA will also provide management and mitigation measures should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.

A Phase 1 Palaeontological Impact Assessment: Field Study will be undertaken during the EIA phase of the assessment to determine whether the development will affect fossiliferous outcrops as the palaeontological sensitivity of the area is VERY HIGH. A Phase 2 Palaeontological Mitigation is only required if the Phase 1 Palaeontological Assessment identified a fossiliferous formation (Karoo Supergroup) and fossils or if fossils are found during construction. The Protocol for Chance Finds and Management Plan will be included in the EMP.

8.5.8 VISUAL IMPACT ASSESSMENT

A detailed Visual Impact Assessment would need to be undertaken during the EIA phase. This would include the following:

- Additional spatial analyses in order to create a visual impact index that will further aid in determining potential areas of visual impact;
- Assessment of mitigation measures;
- A review of the findings of the VIA in accordance with detailed site layouts;
- A comparative assessment of the layout alternatives provided; and
- Addressing any comments or concerns arising from the public participation process.

8.5.9 SOCIAL IMPACT ASSESSMENT

The Social Impact Assessment will be updated during the EIA Phase to include the following:

- Following the approval of the Terms of Reference (ToR) by the Mpumalanga Province: Department of Economic Development, Environment and Tourism, field work will be undertaken to collect socio-economic data. This study will employ a predominantly qualitative approach (i.e. interviews, meetings and focus group discussions) to gather data;

- Identifying the key potential social issues associated with the proposed project (construction, operational, and decommissioning phase);
- Assessing and documenting the significance of social impacts associated with the proposed development; and
- Recommend feasible (practical and cost-effective) mitigation measures to enhance positive effects and reduce negative impacts.

8.5.10 TRAFFIC IMPACT ASSESSMENT

The Traffic Impact Assessment will be updated during the EIA Phase to include the following:

- Assessment of the required site access, parking and internal circulation;
- Updated impact assessment, using NEMA-prescribed methods;
- Recommendations and conclusions with regards to the required traffic and transport related road upgrades; and
- Finalised mitigation measures for inclusion in the Project EMP.

8.6 IMPACT ASSESSMENT METHODOLOGY

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct,[5] indirect,[6] secondary[7] as well as cumulative[8] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[9] presented in **Table 8.3**.

Table 8.3: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries

[5] Impacts that arise directly from activities that form an integral part of the Project.
[6] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[7] Secondary or induced impacts caused by a change in the Project environment.
[8] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[9] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				

IMPACT SIGNIFICANCE RATING			
Total Score	0 – 30	31 to 60	61 – 100
Significance Rating (Negative (-)	**Low (-)**	**Moderate (-)**	**High (-)**
Significance Rating (Positive (+)	**Low (+)**	**Moderate (+)**	**High (+)**

8.6.1 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The mitigation sequence/hierarchy is shown in **Figure 8.1** below.

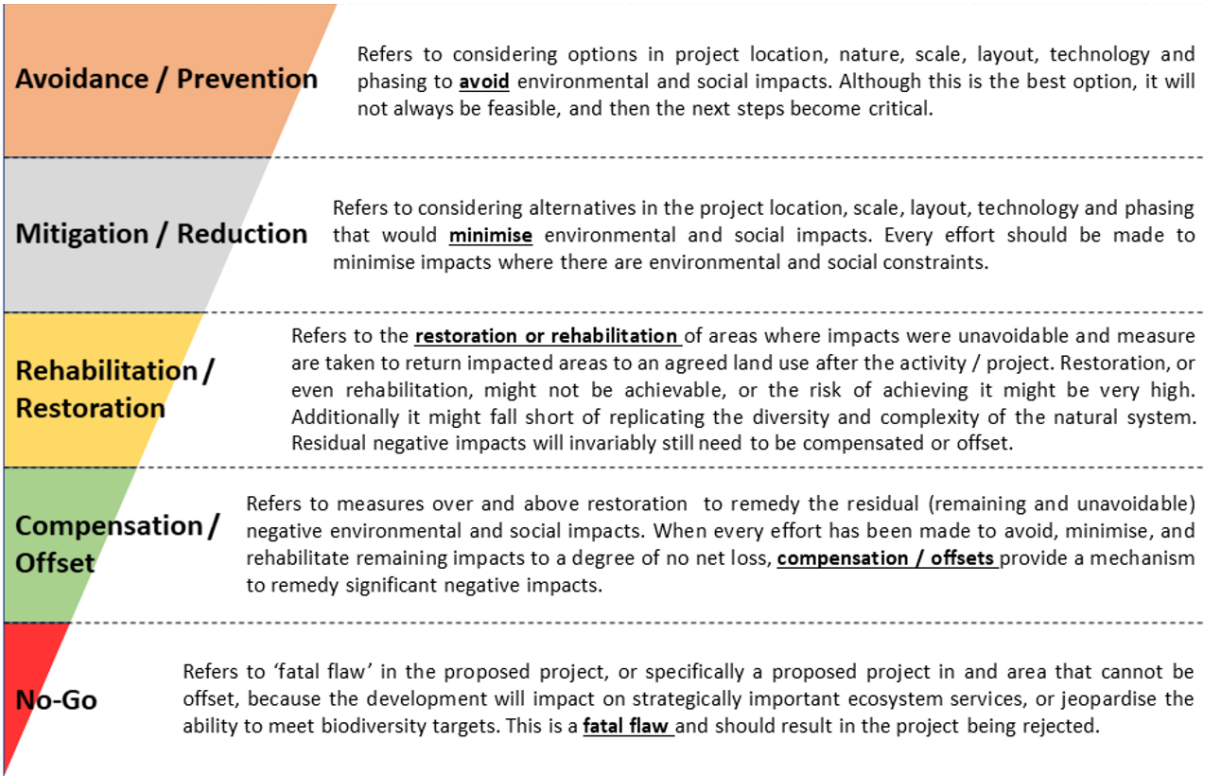


Figure 8.1: Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

8.7 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once the FSR has been approved the proposed project will proceed into detailed EIA phase, which involves the detailed specialist investigations.

WSP will produce a Draft EIAR after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the EIA Regulations, 2014 (GNR 982, as amended) will be included in the Draft EIAR.

The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the S&EIR process, including a curriculum vitae;
- The location of the activity, including the 21 digit Surveyor General code of each cadastral land parcel, where available, the physical address and farm name; and the coordinates of the boundary of the property or properties;
- A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;

- A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the proposed project;
- A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- 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 location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- Details of the public participation process undertaken;
- 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 environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;
- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the proposed activity should or should not be authorised;
- An undertaking under oath or affirmation by the EAP; and
- An EMPr.

8.8 STAKEHOLDER AND AUTHORITY ENGAGEMENT

Public participation during the EIA phase revolves around the review of the environmental impact assessment findings, which will be presented in the Draft EIA Report. All stakeholders will be notified of the progress to date and availability of the Draft EIA Report, via mail, email and/or SMS. A legislated period of 30 consecutive days will be allowed for public comment. Reports will be made available in the following way:

- Distribution for comment at central public places, which were used during the Scoping phase (subject to Covid 19 status quo);
- The document will be made available to download from the WSP website; and
- Copies of CDs will be made available on request.

The EIA phase will provide the following information to I&APs:

- Initial Site Plan;
- Alternatives;
- A description of activities and operations to be undertaken;
- Baseline information;
- Specialist studies;
- Impact assessment;
- Management measures;
- Monitoring and measuring plan; and
- Closure details.

The information outlined above will be presented in one or more of the following:

- Notifications;
- Scoping Report;
- EIA Report; and
- EMPr.

All comments received during the EIA phase will be recorded in the comments and response report (CRR), which will be included in the draft and final EIA Reports. The final EIA Report will incorporate public comment received on the Draft EIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.

All stakeholders will receive a letter notifying them of the authority's decision.

9 CONCLUSION AND WAY FORWARD

This DSR contains:

- A description of the existing and proposed activities;
- A description of the alternatives considered to date;
- An outline of the proposed process to be followed;
- Information on the EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project; and
- Information on the proposed specialist studies to be undertaken.

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures.

The recommendation of this report is that detailed specialist studies as outlined in **Section 8.4** are undertaken.

This DSR is available for review from **03 February 2023 to 06 March 2023**. All issues and comments submitted to WSP will be incorporated in the CRR of the FSR.

The DSR will be submitted to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

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APPENDIX

A EAP CV

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B EAP DECLARATION

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C SPECIALIST DECLARATIONS

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