ESKOM HOLDINGS SOC (LTD)

KOMATI POWER STATION SOLAR PHOTOVOLTAIC, BATTERY ENERGY STORAGE SYSTEM, WIND ENERGY FACILITIES AND ANCILLARY INFRASTRUCTURE

DRAFT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT
PART I - ESIA REPORT

22 AUGUST 2022 FINAL

KOMATI POWER STATION SOLAR PHOTOVOLTAIC, BATTERY ENERGY STORAGE SYSTEM, WIND ENERGY FACILITIES AND ANCILLARY INFRASTRUCTURE

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This Draft Environmental Impact Assessment Report (Report) for the Proposed Construction of a Solar Photovoltaic, Battery Energy Storage System and Wind Energy Facility 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.

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GLOSSARY

ABBREVIATION	MEANING
AC	Alternating current
ADU	Animal Demographic Unit
AEV	Acute Effect Value
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BA	Basic Assessment
BESS	Battery Energy Storage System
BMS	Battery Management System
BTEX	Benzene, toluene, ethylbenzene and xylenes
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CEV	Chronic Effect Value
CSIR	Council for Scientific and Industrial Research
CSM	Conceptual Site Model
CSP	Concentrated Solar Power
CV	Curriculum Vitae
CVB	Channelled valley bottom
CWP	Community Works Programme
DC	Direct current
DDM	District Development Model

ABBREVIATION	MEANING
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and Environment
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act 73 of 1989
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EJETP	Eskom Just Energy Transition project
EPC	Engineering, Procurement, and Construction
EPWP	Expanded Public Works Programme
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
Eskom	Eskom Holdings SOC (Ltd)
ESMP	Environmental and Social Management Plan
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FEPA	Freshwater Ecosystem Priority Area
GBV	Gender-based Violence
GHG	Green House Gas
GIIP	Good International Industry Practice
GPN	Good Practice Notes
GQM	Groundwater Quality Management
GW	Gigawatt

ABBREVIATION	MEANING
HGM	Hydrogeomorphic
HIA	Heritage Impact Assessment
HV	High Voltage
I&AP	Interested and Affected Party
IBA	Important Bird Areas
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
ILO	International Labour Organisation
IPF	Investment Policy Financing
IPG	International Partners Group
IRP	Integrated Resource Plan
IUCN	International Union for Conservation of Nature
JET	Just Energy Transition
JETP	Just Energy Transition Partnership
k	Conductivity
KBA	Key Biodiversity Areas
kV	Kilovolt
LED	Local Economic Development
LSA	Local Study Area
mamsl	Meters above mean sea level
mbgl	Meters below ground level
MBSP	Mpumalanga Biodiversity Sector Plan

ABBREVIATION	MEANING
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)
MVA	Megavolt Amperes
MW	Megawatt
NAPL	Non-Aqueous Phase Liquid
NDM	Nkangala District Municipality
NDP	National Development Plan
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council Act
NEM: WA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	The National Environmental Management: Air Quality Act 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management Protected Areas Act (No. 57 of 2003)
NFEPA	National Freshwater Ecosystem Priority Areas
NGO	Non-governmental organisations
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NIP	National Infrastructure Plan
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998 (Act No. 36 of 1998)

ABBREVIATION	MEANING
NWM	National Wetland Map version 5
O&M	Operations & Maintenance
OHL	Overhead Line
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCC	Presidential Climate Commission
PCD	Pollution Control Dam
PCS	Power Conditioning System
PES	Present Ecological State
PPE	Personal Protective Equipment
PV	Photovoltaics
QDS	Quarter Degree Square
REDZ	Renewable Energy Development Zones
RFI	Radio Frequency Interference
RSA	Regional Study Area
RSL	Regional Screening Levels
S&EIR	Scoping and Environmental Impact Assessment Report
SAAQIS	South African Air Quality Information System
SABAP2	South African Bird Atlas Project 2
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resource Information System

ABBREVIATION	MEANING
SANAS	South African National Accreditation System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SANS	South African National Standards
SANS	South African National Standard
SAR	Site Assessment Report
SAWS	South African Weather Service
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SDG	Sustainable Development Goals
SEP	Stakeholder Engagement Plan
SSL	Soil Screening Levels
SSV	Soil Screening Values
STLM	Steve Tshwete Local Municipality
SVOC	Semi-Volatile Organic Compounds
TDS	Total Dissolved solids
TIC	Tentatively Identified Compounds
TOC	Total Organic Carbon
ToR	Terms of Reference
TWQR	Target Water Quality Range
UN	United Nations
UNDP	United Nations' Development Programmes
USEPA	United States Environmental Protection Agency

ABBREVIATION	MEANING
VOC	Volatile Organic Compounds
WB	World Bank
WBG	World Bank Group
WEF	Wind Energy Facilities
WHO	World Health Organisation
WMA	Water Management Area
WML	Waste Management Licence
WSP	WSP Group Africa (Pty) Ltd
WUL	Water Use Licence

REPORT STRUCTURE

TOPIC	SECTION IN REPORT
National Environmental Legal Framework	Section 2.1
International Environmental and Social Standards	Section 2.4
Stakeholder Engagement	Section 4
Project Description	Section 5
Environmental and Social Context	Section 8
Potential Impacts	Section 9
Cumulative Impacts	Section 9.5
Residual Impacts	Section 9.5
Plan of Study for the Final ESIA	Section 11

TABLE OF CONTENTS

PART I – ESIA REPORT

1 INTRODUCTION.....1

2 GOVERNANCE FRAMEWORK.....8

3 SCREENING METHODOLOGY.....40

4 STAKEHOLDER ENGAGEMENT.....49

5 PROJECT DESCRIPTION.....58

6 NEED AND JUSTIFICATION.....70

7 IDENTIFICATION OF ALTERNATIVES....74

8 ENVIRONMENTAL AND SOCIAL CONTEXT..... 75

9 IDENTIFICATION OF POTENTIAL IMPACTS..... 161

10 DRAFT ESIA IMPACT SIGNIFICANCE . 200

11 PLAN OF STUDY FOR THE ESIA..... 241

12 CONCLUSION AND WAY FORWARD .. 253

BIBLIOGRAPHY..... 254

TABLES

TABLE 1-1 DETAILS OF PROJECT PROPONENT 4
TABLE 1-2 DETAILS OF THE EAP 4
TABLE 1-3: DETAILS OF SPECIALISTS 5
TABLE 2-1 APPLICABLE NATIONAL LEGISLATION 8
TABLE 2-2 APPLICABLE REGIONAL POLICIES AND PLANS 18
TABLE 2-3 PROVINCIAL PLANS 22
TABLE 2-4 DISTRICT AND LOCAL MUNICIPALITY PLANS 23
TABLE 2-5: ENVIRONMENTAL AND SOCIAL STANDARDS APPLICABLE TO THE PROJECT 24
TABLE 2-6: SOCIO-ECONOMIC GUIDELINES APPLICABLE TO THE PROJECT 30
TABLE 2-7: KEY REQUIREMENTS OF WB ESS AGAINST THE SOUTH AFRICAN LEGISLATION 34
TABLE 3-1 SENSITIVIES IDENTIFIED IN THE DFFE SCREENING REPORT 40
TABLE 3-2 SENSITIVIES IDENTIFIED IN THE DFFE SCREENING REPORT 42
TABLE 3-3: ADDITIONAL SENSITIVITIES IDENTIFIED 44
TABLE 3-4 SIGNIFICANCE SCREENING TOOL 45
TABLE 3-5 PROBABILITY SCORES AND DESCRIPTORS 45
TABLE 3-6 CONSEQUENCE SCORE DESCRIPTIONS 45
TABLE 3-7 IMPACT SIGNIFICANCE COLOUR REFERENCE SYSTEM TO INDICATE THE NATURE OF THE IMPACT 46
TABLE 4-1: PRELIMINARY STAKEHOLDER ANALYSIS 50
TABLE 4-2 NOTIFICATION METHODS 54
TABLE 4-3: COMMENTS AND RESPONSES RECEIVED AT FOCUS GROUP MEETING 55
TABLE 5-1 HIGH-LEVEL PROJECT SUMMARY – RENEWABLE ENERGY FACILITIES 62
TABLE 5-2: CONSTRUCTION ACTIVITIES 65
TABLE 5-3: OPERATIONAL ACTIVITIES 66
TABLE 5-4: DECOMMISSIONING ACTIVITIES 67

TABLE 5-5: WASTE MANAGEMENT OPTIONS 68
TABLE 5-6: PRELIMINARY PROJECT TIMEFRAMES 69
TABLE 6-1 OPPORTUNITIES AVAILABLE ALONG THE SOLAR VALUE CHAIN..... 73
TABLE 8-1: SENSITIVE RECEPTORS WITHIN A 10 KM RADIUS OF THE PROPOSED PROJECT 83
TABLE 8-2: SENSITIVE RECEPTORS WITHIN A 5 KM RADIUS OF THE PROPOSED PROJECT 84
TABLE 8-3: HYDROCENSUS BOREHOLES .88
TABLE 8-4: RATINGS FOR THE AQUIFER QUALITY MANAGEMENT CLASSIFICATION SYSTEM 93
TABLE 8-5: APPROPRIATE LEVEL OF GROUNDWATER PROTECTION REQUIRED 93
TABLE 8-6: AQUIFER CLASSIFICATION AND VULNERABILITY ASSESSMENT 93
TABLE 8-7: LAND CAPABILITY: CLASS CONCEPTS 95
TABLE 8-8: LAND CAPABILITY: BROAD LAND USE OPTIONS 96
TABLE 8.9: PROPOSED DEVELOPMENT AREAS..... 97
TABLE 8-10: GROUNDWATER MONITORING DATA (06 JUNE 2022) 102
TABLE 8-11: SUMMARY OF FINDINGS IN SOIL AND GROUNDWATER FOR EACH AREA 108
TABLE 8-12: CONFIRMED/EXPECTED SCC IN THE REGION 118
TABLE 8-13: CONFIRMED/EXPECTED MAMMAL SPECIES WITHIN THE 2629AB AND 2629BA QDS (SYNERGISTICS ENVIRONMENTAL SERVICES, 2008; ANIMAL DEMOGRAPHIC UNIT VIRTUAL MUSEUM, 2022) 119
TABLE 8-14: CONFIRMED/EXPECTED BIRD SPECIES WITHIN THE 2629AB QDS (ANIMAL DEMOGRAPHIC UNIT VIRTUAL MUSEUM, 2022) 120
TABLE 8-15: PREVIOUSLY CONFIRMED FROG SPECIES WITHIN THE 2629BA QDS (ANIMAL DEMOGRAPHIC

UNIT VIRTUAL MUSEUM, 2022) 122
TABLE 8-16: PREVIOUSLY CONFIRMED REPTILE SPECIES WITHIN THE 2629AB AND 2629BA QDS (ANIMAL DEMOGRAPHIC UNIT VIRTUAL MUSEUM, 2022)..... 123
TABLE 8-17: SUMMARY OF IMPACT SCORES AND PES CLASS..... 133
TABLE 8-18: SUMMARY OF WETLAND EIS SCORES AND RATINGS 137
TABLE 8-19: CAPACITY ANALYSIS RESULTS FOR THE WEEKDAY AM PEAK HOUR 142
TABLE 8-20: CAPACITY ANALYSIS RESULTS FOR THE WEEKDAY PM PEAK HOUR 142
TABLE 8-21: DISTRIBUTION OF STLM BY POPULATION GROUP 156
TABLE 8-22: DISTRIBUTION OF STLM BY LANGUAGE SPOKEN..... 157
TABLE 8-23: DISTRIBUTION OF THE LEVELS OF EDUCATION REPRESENTED IN THE MUNICIPALITY..... 157
TABLE 9-1: POTENTIAL IMPACTS FOR SOLAR AND BESS FACILITIES 162
TABLE 9-2: POTENTIAL IMPACTS FOR WEF 178
TABLE 9-3: WASTE MANAGEMENT OPTIONS 196
TABLE 10-1: POTENTIAL CONSTRUCTION PHASE IMPACTS 200
TABLE 10-2: POTENTIAL OPERATIONAL PHASE IMPACTS 203
TABLE 10-3: POTENTIAL DECOMMISSIONING PHASE IMPACTS 204
TABLE 10-4: PROPOSED MITIGATION MEASURES FOR CONSTRUCTION PHASE IMPACTS 206
TABLE 10-5: PROPOSED MITIGATION MEASURES FOR OPERATIONAL PHASE IMPACTS 213
TABLE 10-6 PROPOSED MITIGATION MEASURES FOR DECOMISSIONING PHASE IMPACTS 215
TABLE 10-7: POTENTIAL CONSTRUCTION PHASE IMPACTS 219
TABLE 10-8: POTENTIAL OPERATIONAL PHASE IMPACTS 222

TABLE 10-9: POTENTIAL DECOMMISSIONING PHASE IMPACTS 224
TABLE 10-10 PROPOSED MITIGATION MEASURES FOR CONSTRUCTION PHASE IMPACTS 226
TABLE 10-11 PROPOSED MITIGATION MEASURES FOR OPERATIONAL PHASE IMPACTS 233
TABLE 10-12 PROPOSED MITIGATION MEASURES FOR DECOMISSIONING PHASE IMPACTS 236
TABLE 11-1: NATURE OR TYPE OF IMPACT 242
TABLE 11-2: PHYSICAL EXTENT RATING OF IMPACT 243
TABLE 11-3: DURATION RATING OF IMPACT 243
TABLE 11-4: REVERSIBILITY OF THE IMPACT 244
TABLE 11-5: MAGNITUDE RATING OF IMPACT 244
TABLE 11-6: PROBABILITY RATING OF IMPACT 244
TABLE 11-7: PUBLIC PARTICIPATION ACTIVITIES DURING ESIA 250

FIGURES

FIGURE 1-1: LOCALITY MAP 3
FIGURE 5-1: ILLUSTRATION OF THE MAIN COMPONENTS OF A SOLAR POWER PLANT 59
FIGURE 5-2: BESS COMPONENTS SCHEMATIC (SOURCE: WWW.RESEARCHGATE.NET).. 59
FIGURE 5-3: ILLUSTRATION OF THE MAIN COMPONENTS OF A WIND TURBINE..... 60
FIGURE 5-4: SITE LAYOUT 61
FIGURE 5-5: TYPICAL TURBINE HARD STANDING REQUIREMENTS (ILLUSTRATION PURPOSES ONLY)..... 63
FIGURE 8-1: AVERAGE, MAXIMUM AND MINIMUM TEMPERATURES FOR THE PERIOD JANUARY TO DECEMBER 2018 FROM THE KOMATI STATION (SAAQIS) 76

FIGURE 8-2: MONTHLY RAINFALL AND AVERAGE HUMIDITY FOR THE PERIOD JANUARY TO DECEMBER 2018 FROM THE KOMATI STATION (SAAQIS) 76
FIGURE 8-3: LOCAL WIND CONDITIONS FOR THE PERIOD JANUARY TO DECEMBER 2018 FROM THE KOMATI STATION (SAAQIS) 78
FIGURE 8-4: TOPOGRAPHY 79
FIGURE 8-5: GEOLOGICAL MAP OF THE AREA 80
FIGURE 8-6: SEISMIC HAZARD MAP AND ZONES (SOURCE: ESKOM, 2022) 81
FIGURE 8-7: A RECENT SEISMIC HAZARD MAP (2003) OBTAINED FROM THE COUNCIL FOR GEOSCIENCE (SOURCE: ESKOM, 2022)..... 82
FIGURE 8-8: SITE LAYOUT AND SENSITIVE RECEPTORS FOR THE PROPOSED PROJECT 83
FIGURE 8-9: SITE LAYOUT AND SENSITIVE RECEPTORS FOR THE PROPOSED PROJECT 85
FIGURE 8-10: QUATERNARY CATCHMENT OF THE PROJECT AREA AND SURROUNDS 86
FIGURE 8-11: GROUNDWATER INVESTIGATION AREA..... 87
FIGURE 8-12: HYDROCENSUS 90
FIGURE 8-13: GROUNDWATER CONTOURS (HALENYANE, 2019)..... 92
FIGURE 8-14: SOIL CLASS 96
FIGURE 8-15: LAND CAPABILITY (SCHOEMAN *ET AL.*, 2000)..... 97
FIGURE 8-16: SAMPLE LOCALITIES 104
FIGURE 8-17: LOCAL AND REGIONAL STUDY AREAS..... 112
FIGURE 8-18: MPUMALANGA BIODIVERSITY SECTOR PLAN IN RELATION TO THE PROPOSED DEVELOPMENT 113
FIGURE 8-19: PRIORITY AREAS FOR PROTECTED AREA EXPANSION IN RELATION TO THE PROPOSED DEVELOPMENT..114
FIGURE 8-20: NATURAL, MODIFIED AND CRITICAL HABITAT 115
FIGURE 8-21: PROPOSED DEVELOPMENT IN RELATION TO MUCINA &

RUTHERFORD VEGETATION TYPES 116
FIGURE 8-22: PROPOSED DEVELOPMENT IN RELATION TO THE NATIONAL THREATENED ECOSYSTEMS (SANBI, 2018) 117
FIGURE 8-23: GRASS OWL SENSITIVITY MAP 122
FIGURE 8-24: AQUATIC BIODIVERSITY LOCAL STUDY AREA 124
FIGURE 8-25: AQUATIC BIODIVERSITY REGIONAL STUDY AREA AS DEFINED BY THE QUATERNARY CATCHMENT B11B 124
FIGURE 8-26: MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY (ENVIRONMENTAL SCREENING TOOL, 2022) 125
FIGURE 8-27: MBSP FRESHWATER ASSESSMENT (MTPA, 2011) ... 126
FIGURE 8-28: STUDY AREA IN RELATION TO FEPA SUB-CATCHMENTS 127
FIGURE 8-29: PROPOSED DEVELOPMENT IN RELATION TO NFEPA WETLANDS (2011) 127
FIGURE 8-30: PROPOSED DEVELOPMENT IN RELATION TO NWM5 WETLANDS (2019) 128
FIGURE 8-31: AN OVERVIEW OF THE CHANNELLED VALLEY BOTTOM WETLAND (UPSTREAM AND DOWNSTREAM) 129
FIGURE 8-32: SOIL SAMPLE TAKEN AT 50-60 CM IN THE SEASONAL ZONE OF THE WETLAND 129
FIGURE 8-33: 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 130
FIGURE 8-34: AN OVERVIEW OF THE SEEP WETLAND: UPSTREAM AND DOWNSTREAM VIEW 130
FIGURE 8-35: SOIL SAMPLE TAKEN AT THE PERMANENT ZONE OF THE WETLAND 131
FIGURE 8-36: WETLAND DELINEATION AND CLASSIFICATION 132

FIGURE 8-37: 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.....134
FIGURE 8-38: ASH DAM FACILITY AND POOLING OF WATER AT DAM135
FIGURE 8-39: 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.....136
FIGURE 8-40: ECOSYSTEM SERVICES SUPPLIED BY/DEMANDED FROM THE CVB WETLAND.....137
FIGURE 8-41: ECOSYSTEM SERVICES SUPPLIED BY/DEMANDED FROM SEEP WETLANDS.....138
FIGURE 8-42: ECOSYSTEM SERVICES SUPPLIED BY/DEMANDED FROM DEPRESSION WETLAND.....138
FIGURE 8-43: NATURAL, MODIFIED AND CRITICAL HABITAT 139
FIGURE 8-44: LOCALITY MAP SHOWING ROADS IN THE VICINITY OF THE DEVELOPMENT (ITS, 2022).....140
FIGURE 8-45: INTERSECTIONS FOR TRAFFIC COUNT.....141
FIGURE 8-46: VIEW OF THE PV SITE A FROM THE R542 ARTERIAL ROAD (LOGIS, 2022) 145
FIGURE 8-47: VIEW OF THE PV SITE B FROM THE WEST.....145
FIGURE 8-48: TYPICAL COAL MINING ACTIVITY WITHIN THE STUDY AREA.....146
FIGURE 8-49: GENERAL ENVIRONMENT WITHIN THE STUDY AREA.....146
FIGURE 8-50: POWER LINES NEAR THE R542 ARTERIAL ROAD 147
FIGURE 8-51: THE KOMATI COAL-FIRED POWER STATION AND ASSOCIATED INFRASTRUCTURE 147
FIGURE 8-52: MAP INDICATING THE POTENTIAL (PRELIMINARY) VISUAL EXPOSURE OF THE PROPOSED KOMATI POWER

STATION SOLAR PV ENERGY FACILITY 149
FIGURE 8-53: MAP INDICATING THE POTENTIAL (PRELIMINARY) VISUAL EXPOSURE OF THE PROPOSED KOMATI POWER STATION BESS 150
FIGURE 8-54: SOUTH AFRICAN REGIONAL MAP 153
FIGURE 8-55: NKANGALA DISTRICT MUNICIPALITY 154
FIGURE 8-56: STLM POPULATION SIZE 155
FIGURE 8-57: STLM GENDER DISTRIBUTION 156

APPENDICES

PART II – APPENDICES A – D-3

A EAP CVS

B SPECIALIST CVS

C DFFE SCREENING REPORTS

C-1 DFFE Screening Report for Solar PV and BESS

C-2 DFFE Screening Report for WEF

D PROOF OF PUBLIC PARTICIPATION

D-1 Proof of Newspaper Adverts

D-2 Proof of Site Notices

D-3 Focus Group Meeting Register and Notes

PART III – APPENDICES E-1 – E-7

E SPECIALIST STUDIES

E-1 Air Quality

E-2 Noise

E-3 Soil and Agricultural Potential

E-4 Surface Water

E-5 Terrestrial Biodiversity

E-6 Heritage

E-7 Paleontology

PART IV – APPENDICES E-8 – E-14

E-8 Visual

E-9 Aquatic Biodiversity

E-10 Traffic

E-11 Social

E-12 Groundwater

E-13 Contaminated Land

E-14 Geotechnical Desktop Study

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Eskom Holdings SOC (Ltd) (Eskom) to undertake an Environmental and Social Impact Assessment (ESIA) to meet the requirements of both the World Bank Group (WBG) Environmental and Social Framework (ESF) and the Environmental Impact Assessment (EIA) requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed 100 megawatt (MW) Solar Photovoltaics (PV) Energy (an additional 50MW PV on the ashing facility in Phase II to be confirmed following decommissioning and rehabilitation activities), 150 MW Battery Energy Storage System (BESS); up to 70 MW Wind Energy Facilities (WEF) and ancillary infrastructure at the Komati Power Station located in the Mpumalanga Province, South Africa. The 70 MW WEF will be phased, with 50 MW installation during Phase I and 20 MW during Phase II following rehabilitation of decommissioned footprints. The Solar PV, BESS and WEF project forms part of the greater Eskom Just Energy Transition project (EJETP) supported by the WBG. The EJETP consists of three components namely (i) the decommissioning of Komati Power Plant (Component A); (ii) the repurposing the Komati Power Station Complex with renewables (Component B) and (ii) creating opportunities for workers and communities (Component C).

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. EJETP'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.

The purpose of this report is to undertake a draft assessment of the environmental and social and impacts of repurposing the Komati Power Station Complex with renewables (Component B). The environmental and social and impacts related to the decommissioning (shutdown and dismantling) (Component A) of the Komati Power Station is being assessed separately by Nemai Consulting. Findings from this draft assessment will inform the preparation of the final ESIA.

1.1 PURPOSE OF THIS REPORT

This assessment aims to undertake the following:

- Determine the baseline environmental and social context;
- Identify potential positive and negative environmental and social impacts arising from the proposed Solar PV and BESS project;
- Identify potential positive and negative environmental and social impacts arising from the proposed WEF project;
- Propose preliminary mitigation measures to enhance positive impacts and to offset the negative impacts;
- Assess alternative options and propose the best option for consideration as part of the final ESIA process;
- Outline the Terms of Reference (ToR) for the Specialist Studies for the final ESIA Phase of process; and
- Identification of the key stakeholders and their issues of concerns that needs to be considered going forward.

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.

South Africa's National Development Plan (NDP) is a long-term development plan for the country that was published in 2012. The NDP aims to alleviate key national challenges and as the triple challenge of poverty, unemployment and social inequality by 2030, on the path towards a sustainable future. According to the NDP, to manage a just transition to a low-carbon economy, it is essential that there is policy alignment at all levels of government in relation to priorities and considerations when investing in infrastructure that has long-term consequences for the environment and national mitigation targets. As outlined in the NDP, the Just Transition refers to a transition towards a low-carbon economy and a climate resilient society in a manner that does not impede socio-economic development, is socially just, and results in an increase in sustainable jobs.

Eskom's 2035 plan is in line with the intentions of the Just Energy Transition (JET), a long-term partnership between the governments of South Africa, France, Germany, the United Kingdom, and the United States of America, along with the European Union. The Partnership aims to accelerate the decarbonization of South Africa's economy, with a focus on the electricity sector, to help it achieve the ambitious goals set out in its updated Nationally Determined Contribution emissions goals.

Several power stations are reaching the end-of-life. Eskom is considering a shutdown, dismantling and repurposing of several power stations. Komati Power Station, located near Middelburg in the Mpumalanga Province (Refer to **Figure 1-1**), will reach its end-of-life in September 2022. Units 1 to 8 have already reached been shutdown.

Eskom has developed an 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. The shutdown and dismantling of Komati Power Station (Component A) will immediately result in a reduced environmental footprint and Green House Gas (GHG) Emissions, ensure that dismantling is carried out in a responsible manner and include opportunities for repurposing some of the existing infrastructure.

Component B (This project) 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 Solar PV energy facility (an additional 50MW PV on the Ash Dam facility in Phase II to be confirmed following decommissioning and rehabilitation activities), as well as a 150MW BESS facilities, and a WEF which will include the installation of approximately 7 turbines with a total of up to 70 MW generating capacity.

Component C is centred around three key pillars: (a) Transition support for Komati Permanent Workers, Suppliers and Contract Workers; (b) Community Development; and (c) Stakeholder engagement.

Eskom will develop and execute this renewable energy project. Eskom has requested the independent consultant to ensure that the Project is carried out in accordance with the World Bank (WB) Environmental and Social Standards (ESSs), in a manner that is acceptable to the World Bank.

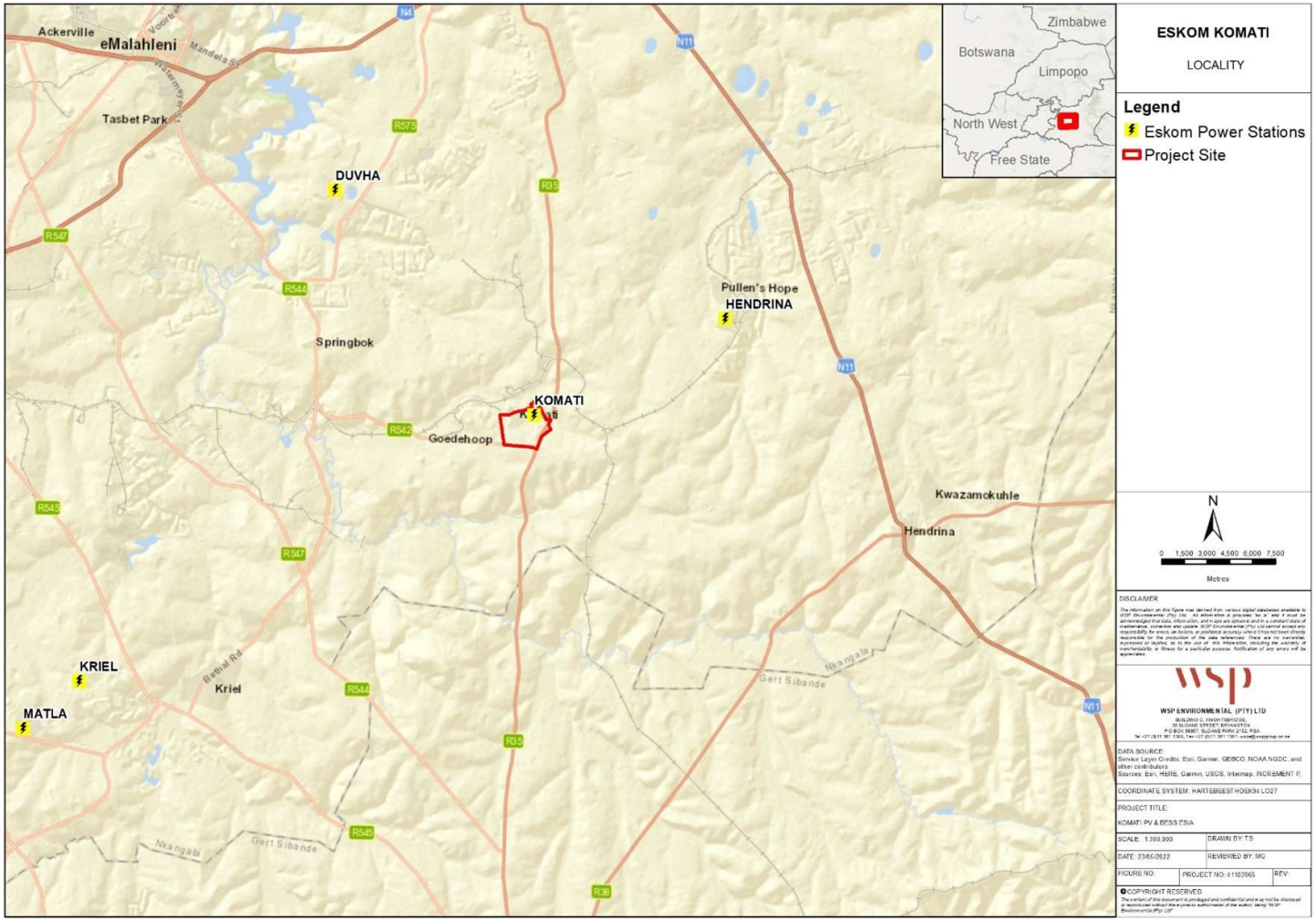


Figure 1-1: Locality Map

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, WEF and ancillary 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 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the ESIA for the development of the Project. The Curriculum Vitae (CV) of the EAP is available in **Appendix A**. **Table 1-2** details the relevant contact details of the EAP. To adequately identify and assess potential environmental and social impacts, a number of specialists will support the EAP.

Table 1-2 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

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.

1.3.3 SPECIALISTS

Specialist input was required in support of this Draft ESIA. The details of the specialists are provided in **Table 1-3** below.

Table 1-3: Details of Specialists

ASSESSMENT	NAME OF SPECIALIST	COMPANY	SECTIONS IN REPORT
Air Quality	Kirsten Collet	WSP	Section 8.1 Section 8.1.39 Appendix **Error! Reference source not found.**
Noise	Kirsten Collet	WSP	Section 8.1.6 Section 8.1.6 Appendix **Error! Reference source not found.**
Soils and Land Capability	Zakariya Nakhooda	WSP	Section 8.1.9 Section 8.1.9 Appendix **Error! Reference source not found.**
Surface Water	Eugeshin Naidoo	WSP	Section 8.1.7 Section 8.1.7 Appendix **Error! Reference source not found.**
Terrestrial Biodiversity	Tebogo Khoza	WSP	Sections 8.2.1; 8.2.2 and 8.2.3 Section 8.2.1 Appendix **Error! Reference source not found.**
Contaminated Land	Adam Sanderson	WSP	Sections 8.1.10 Section 9.3 Appendix **Error! Reference source not found.**

ASSESSMENT	NAME OF SPECIALIST	COMPANY	SECTIONS IN REPORT
Groundwater	Sarah Skinner	WSP	Sections 8.1.8 Section 8.1.8 Appendix **Error! Reference source not found.**
Heritage	Anton Pelser	A Pelser Archaelogical Consulting	Section 8.3.3 Section 8.3.3 Appendix **Error! Reference source not found.**
Palaeontology	Heidi Fourie	Independent Consultant	Sections 8.1.3 and 8.3.4 Section 8.3.4 Appendix **Error! Reference source not found.**
Social	Stephen Horak	WSP	Sections 8.3.5 Section 8.3.5 Appendix **Error! Reference source not found.**
Traffic	Nico Jonker	Innovative Transport Solutions (Pty) Ltd	Sections 8.3.1 Section 8.3.1 Appendix **Error! Reference source not found.**
Visual	Lourens du Plessis	LOGIS	Sections 8.1.2 and 8.3 Section 8.3.2 Appendix **Error! Reference source not found.**

ASSESSMENT	NAME OF SPECIALIST	COMPANY	SECTIONS IN REPORT
Aquatic Biodiversity	Bradley Graves	WSP	Section 8.2.4 Section 8.2.4 Appendix **Error! Reference source not found.**

1.4 TERMS OF REFERENCE

This Draft ESIA phase was undertaken to identify the potential environmental and social risks and benefits (negative and positive impacts) of activities associated with the proposed project. It also includes the initial identification of key aspects that require further assessment, planning and management that will be undertaken during the final ESIA Phase.

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 a Scoping and Environmental Impact Assessment Report (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 Department of Forestry, Fisheries and Environment (DFFE) as the competent authority (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 **Solar PV and BESS Applicability:** The Komati Solar PV facility will require a 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.
	Activity 12(ii) The development of -

[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
	(ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse; **Solar PV and BESS Applicability:** 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. **WEF Applicability:** Internal access roads will be required for access to the Facility. The physical footprint of internal access roads will either traverse the delineated watercourses on site, or be located within 32m of the outer extent of the delineated watercourses on site.
	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. **Solar PV and BESS Applicability:** 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.
	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. **Solar PV and BESS Applicability:** 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. **WEF Applicability:** Internal access roads will be required for access to the WEF. The physical footprint of internal access roads will either traverse the delineated watercourses on site, or be located within 32m of the outer extent of the delineated watercourses on site.
	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. **Solar PV and BESS Applicability:** The proposed access roads for the Solar facility will potentially be 8 metres wide. This will be confirmed during the design phase. **WEF Applicability:** The proposed access roads for the WEF will potentially be 8 metres wide. This will be confirmed during the design phase.
	Activity 1

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Listing Notice 2: GNR 983	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. **Solar PV and BESS Applicability:** 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. An additional 50MW of PV will be assessed but as this links to the decommissioning of the ashing facility which forms part of a separate ESIA, this 50MW is planned to be completed at a later stage. **WEF Applicability:** The proposed project entails the construction and operation of a wind energy facility that will generate up to 70 MW of electricity from a renewable resource (wind). The proposed project is located outside an urban area.
	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. **Solar PV and BESS Applicability:** The proposed solar generating facilities will require the clearance of vegetation between 200 and 250 ha. **WEF Applicability:** The proposed WEF will require the clearance of vegetation of more than 20 Ha (subject to finalisation based on technical, final design and environmental requirements).
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. **Solar PV and BESS Applicability:** The proposed access roads for the Solar facility will potentially be less than 13.5 metres wide within a critical biodiversity area (CBA). This will be confirmed during the design phase. **WEF Applicability:** The proposed access roads for the WEF will potentially be less than 13.5 metres wide within a CBA. This will be confirmed during the design 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

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. **Solar PV and BESS Applicability:** 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.
	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. **Solar PV and BESS Applicability:** 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 ESIA process through the biodiversity impact study.
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 (WML) as defined in GNR 921. However, the contents of the ESIA Report will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Waste Act (59 of 2008) (NEM:WA) – Part 8	The Contaminated Land Assessment covers the soil and groundwater requirement anticipated in the context of Part 8 of the National Environmental Management: Waste Act (NEM: WA) and will be undertaken in general accordance with the requirements of the South African Framework for the Management of Contaminated Land (May 2010). **Regulations Regarding Extended Producer Responsibility (Government Notice 43879)** The purpose of these Regulations is- (1) to provide the framework for the development, implementation, monitoring and evaluation of extended producer responsibility schemes by producers in terms of Section 18 of the Act; (2) to ensure the effective and efficient management of the identified end-of-life products; and(3) to encourage and enable the implementation of the circular economy initiatives. Responsibility for the Solar PVs, BESS and Wind Turbines will belong to the developer. At the end-of-life, the developer will be responsible for removing and disposing of the infrastructure. Whilst broadly complying with Part 8 of the NEM: WA, the contaminated land report does not constitute a Site Assessment Report as described thereunder. The objective of the preliminary contamination assessment is to provide a review of available existing information and present the findings of the contemporary works. The aim of this report is therefore to: — Establish the environmental setting/s of the relevant development areas at Komati Power Station based on a review of existing information in conjunction with site reconnaissance, targeted intrusive investigations and laboratory analysis of selected samples;

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	– Prepare a Conceptual Site Model (CSM) utilising the supplementary information to conceptualise the hydrological, geological and hydrogeological conditions in respect to possible contamination concerns; – Interpret the significance of recorded contamination impacts in broad accordance with Part 8 of the NEM:WA to ascertain the requirement for additional works and/or remediation.
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 and Social Management Plan (ESMP). A biodiversity assessment will be carried out during the Final ESIA 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.
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 with the Department of Water and Sanitation (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 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.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
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 South African Heritage Resources Agency (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 (HIA) 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). The ESIA report will be loaded onto the South African Heritage Resource Information System (SAHRIS) portal as well as to the Mpumalanga Provincial Heritage Resource Authority (MPHRA) for comment by SAHRA and MPHRA respectively.
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) 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 the 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 –*

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
	(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.
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, Air Traffic and Navigation Services (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. The aim of the OHSA is to provide for the safety and health of persons at work and in connection with the use of machinery. It further provides for the protection of people other than people at work from hazards arising out of or in connection with the activities from people at work.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
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.
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.
National Economic Development and Labour Council Act,	The National Economic Development and Labour Council Act (NEDLAC) aims to provide for the establishment of a national economic, development andlabour council; to repeal certain provisions of the Labour Relations Act, 1959; and to provide for matters connected therewith.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
1994 (Act No. 35 of 1994)	NEDLAC has published four codes of good practice: — Picketing; — The handling of sexual harrassment cases; — Dismissals based on operational requirements; and — Key aspects of HIV/AIDS and employment. The following Eskom's governance documents are applicable to the above: — Disciplinary Code Standard (32-1112); — Disciplinary Procedure (32-1113); — Grievance Procedure (32-1114); — Management of Sickness Absence Procedure (240-102796274)
Basic Conditions of Employment Act No. 75 of 1997	The purpose of the Basic Conditions of Employment Act is to give effect to the right to fair labour practices, as referred to in Section 23 (1) of the Constitution, by establishing and providing for the regulation of basic conditions of employment.
Labour Relations Act 66 of 1995	The purposeof the Labour Relations Act 66 of 1995 is to give effect to the public international law obligations of the Republic relating to labour relations; to amend and repeal certain laws relating to labour relations; and. to provide for incidental matters. 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. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners, in line with the requirements of the act and applicable WB ESS; as the Project moves towards implementation. The ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation, WB ESS 2 and good practice on the part of the contractors.
Employment Equity Act 55 of 1998	The purpose of the Employment Equity Act 55 of 1998 is to remove discrimination, implement affirmative action and to promote equity, equality, opportunity, remuneration and development for all employees in the workplace. 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. Recommendations are provided concerning development of a detailed HR and OHS system by the developer and its partners, in line with the requirements of the act and applicable WB ESSs; as the Project moves towards implementation. The ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation, WB ESS 2 and good practice on the part of the contractors.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000	The Promotion of Equality and Prevention of Unfair Discrimination Act, 2000 (or the Equality Act, Act No. 4 of 2000) is a comprehensive South African anti-discrimination law. It prohibits unfair discrimination by the government and by private organisations and individuals and forbids hate speech and harassment. 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. Recommendations are provided concerning development of a detailed HR and OHS system by the developer and its partners, in line with the requirements of the act and applicable WB ESSs; as the Project moves towards implementation. The ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation, WB ESS 2 and good practice on the part of the contractors.
Promotion of Access to Information Act 2000	The Promotion of Access to Information Act 2 of 2000 intends: to give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and. to provide for matters connected therewith. 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. Recommendations are provided concerning development of a detailed HR and OHS system by the developer and its partners, in line with the requirements of the act and applicable WB ESSs; as the Project moves towards implementation. The ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation, WB ESS 2 and good practice on the part of the contractors.
Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019	The Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019 aims to provide for the management of rights of indigenous knowledge communities and encourage the use of indigenous knwoledge in the development of socially and economically applicable products and services. Urban-Econ is undertaking a Stakeholder Engagement Process whereby the local community is informed of the project and can provide input and suggestions as the project develops.

LEGISLATION	DESCRIPTION OF LEGISLATION AND APPLICABILITY
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 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 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.

2.2 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 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 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 medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes:

APPLICABLE POLICY	DESCRIPTION OF POLICY
	— 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.
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

APPLICABLE POLICY	DESCRIPTION OF POLICY
	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. 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

APPLICABLE POLICY	DESCRIPTION OF POLICY
	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.
National Climate Change Response White Paper	The National Climate Change Reponse White Paper presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has two objectives: — Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity. — Make a fair contribution to the global effort to stabilise GHG concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner

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.
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

APPLICABLE PLAN	DESCRIPTION OF PLAN
	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.

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) (MSA), 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 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 (STLM) Integrated Development Plan	The STLM 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.

APPLICABLE PLAN	DESCRIPTION OF PLAN
	— 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 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 WBG's commitment to sustainable development through ten ESSs that are designed to support Borrowers' environmental and social risk management. 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.	This document is the Draft ESIA 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 ESMP will be compiled during the ESIA phase of the project.

STANDARD	REFERENCE	APPLICABILITY
	— 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	
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. — To provide project workers with accessible means to raise workplace concerns.	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 ESIA 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 ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
ESS 3: Resource Efficiency and Pollution Prevention andManagement	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 waste, hazardous substances, and stormwater during the project life cylce are assessed in Section 9 of this report. There are no material resource efficiency issues associated with the Project. The ESMP 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 proposed project seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution during the project life cycle will be addressed in the ESMP. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary

STANDARD	REFERENCE	APPLICABILITY
		wastewater is low and mitigation measures will be included in the ESMP. Section 4.6.4 identifies the different waste streams that is expected to be generated from this project and identifies management options. Disposal methods for Solar Panels, Wind Turbines and BESS facilities are still being investigated and will be further developed at the appointment of the Engineering and Procurement Contractor. The ESMP 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. — 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.	The requirements included in ESS 4 will be addressed in the ESIA process and the development of the ESMP. 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 ESIA process and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, will be detailed in the ESMP.
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.	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.

STANDARD	REFERENCE	APPLICABILITY
	— 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 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. — 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 Project Area falls within CBAs. A Biodiversity Impact Assessment as well, Avifaunal Impact Assessment, Bats Study 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 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 and in line with ESS6. The prevalence of invasive alien species will be determined, and mitigation and management measures will be included in the final ESIA and ESMP.
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	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.

STANDARD	REFERENCE	APPLICABILITY
	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.	
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: — 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 desktop Heritage Scoping Report has been compiled by a suitably qualified specialist. A Chance Find Procedure will be included in the ESMP during the ESIA 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.

STANDARD	REFERENCE	APPLICABILITY
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 ESIA process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations and ESS10. 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. The Technical Note: "Public Consultations and Stakeholder Engagment in WB-supported operations when there are constraints on conducting public meetings", March 2020, will be used as guidance in the stakeholder engagement process.

2.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the WBG has published the WB Environmental and Social Framework which includes 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 WB ESS, 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 ESIA 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 ESIA report.

— *EHS Guidelines for Wind Energy, August 7, 2015* - includes information relevant to environmental, health, and safety aspects of onshore and offshore wind energy facilities.

2.4.3 INTERNATIONAL LABOUR ORGANISATION CONVENTIONS

Since 1919, the International Labour Organisation (ILO) has maintained and developed a system of international labour standards aimed at promoting opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and dignity. In today's globalised economy, international labour standards are an essential component in the international framework for ensuring that the growth of the global economy provides benefits to all (https://www.ilo.org/global/standards/introduction-to-international-labour-standards/lang--en/index.htm).

The ILO fundamental Conventions ratified by South Africa are:

— C029 - The Forced Labour Convention, 1930 (No. 29), ratified 05 March 1997;

— C105 - The Abolition of Forced Labour Convention, 1957 (No. 105), ratified 05 March 1997;

— C087 - The Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87), ratified 19 February 1996;

— C098 - The Right to Organise and Collective Bargaining Convention, 1949 (No. 98), ratified 19 February 1996

— C100 - The Equal Remuneration Convention, 1951 (No. 100), ratified 30 March 2000;

— C111 - The Discrimination (Employment and Occupation) Convention, 1958 (No. 111), ratified 05 March 1997;

— C138 - The Minimum Age Convention, 1973 (No. 138), ratified 30 March 2000;

— C155 – Occupational Safety and Health Convention, 1981 (No. 155), ratified 18 February 2003 and

— C182 - The Worst Forms of Child Labour Convention, 1999 (No. 182), ratified 07 June 2000.

The construction of the Solar PV, BESS and WEF 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.

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 ESMP will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.

2.4.4 SOCIO-ECONOMIC GUIDELINES

The development of this ESIA has taken several socio-economic guidelines into consideration in order to identify and minimise adverse social effects that may occur as a result of the project. These guidelines are included in **Table 2-6**. The guidelines include Good Practice Notes (GPNs) which are produced to help the WB in providing implementation support to Borrowers in meeting the requirements of the ESF (World Bank, 2019), as well as relevant South African legislation.

Table 2-6: Socio-Economic guidelines applicable to the project

GUIDELINE	REFERENCE	APPLICABILITY
GPN - Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment	This GPN aims to assist Task Teams in identifying risks of SEA/SH that can emerge in projects involving major civil works contracts – and to advise on how to best manage such risks.	The ESIA will identify the potential social impacts that the project may have on women in the project affected area and

GUIDELINE	REFERENCE	APPLICABILITY
Project Financing involving Major Civil Works, 2020		will recommend measures to mitigate these potential impacts.
GPN - Addressing Gender Based Violence in Investment Project Financing involving Major Civil Works, 2018	This GPN seeks to assist Task Teams in establishing an approach to identify risks of Gender Based Violence, in particular SEA and SH, that can emerge in Investment Project Financing with major civil works contracts and to advise accordingly on how to best manage such risks. The GPN builds on WB experience and GIIP, including those of other development partners. While WB Task Teams are the primary audience, the GPN also aims to contribute to a growing knowledge base on the subject.	The ESIA identifies the potential social impacts that the project may have on women in the project affected area.
GPN – Gender, 2019	To address constraints cited in many economies as impediments to closing these gaps, such as occupational sex segregation, with women and girls often streamed into lower-paying, less secure fields of study and work; high rates of unpaid work by women; lack of safe, affordable transportation; high prevalence of gender-based violence and, more specifically, of SEA/SH in workplaces; lack of clear land and housing ownership and tenure security, wherein women's rights tend to be informal so that they are at greater risk of being displaced from land and other asset ownership; and inadequate investment in and prioritization of care services, from early childhood to old age. The strategy sets out to help countries address challenges such as maternal mortality while also considering emerging challenges such as ageing populations, climate change, fragility, conflict, and violence, and slowing economic growth.	The ESIA will identify the potential social impacts that the project may have on the health and wellbeing of women in the project affected area. It also assess the potential impacts on the social standing and benefits from the project. There will be no physical or economic displacement as a result of the project.
GPN - Road safety, 2019	The ESF road safety requirements are defined in ESS 4. The following objective are applicable: — To identify, evaluate and monitor the potential traffic and road safety risks to workers, affected communities and road users throughout the project life-cycle and, where appropriate, will develop measures and plans to address them. The Borrower will incorporate technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and affected communities" — To undertake a road safety assessment for each phase of the project, and will monitor incidents and accidents, and prepare regular reports of such monitoring. The Borrower will use the reports to identify	The impacts on traffic and general road safety in the project affected area will be assessed in the ESIA.

GUIDELINE	REFERENCE	APPLICABILITY
	negative safety issues, and establish and implement measures to resolve them. — To put in place appropriate processes, including driver training, to improve driver and vehicle safety, as well as systems for monitoring and enforcement. The Borrower will consider the safety record or rating of vehicles in purchase or leasing decisions and require regular maintenance of all project vehicles. — To take appropriate safety measures to avoid the occurrence of incidents and injuries to members of the public associated with the operation of construction equipment.	
GPN - Assessing and managing the risks and impacts of the use of security personnel, 2018	To assess and manage potential environmental and social risks and impacts arising from projects.	The health and safety and security of communities is assessed and considered in the ESIA.
GPN - Assessing and Managing the risks of adverse impacts on communities from temporary project induced labor influx, 2016	To assist the identification and management of risks to and impacts on local communities related to the influx of labor that typically results from construction works	The potential impacts of the influx of labourers and labour seekers will be assessed in the ESIA.
Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)	Workers and employers, without distinction whatsoever, shall have the right to establish and, subject only to the rules of the organisation concerned, to join organisations of their own choosing without previous authorisation.	The right to associate is enshrined in the constitution of South Africa. Eskom will adhere to the ILO Conventions which have been ratified by South Africa.
Right to Organise and Collective Bargaining Convention, 1949 (No. 98)	Workers' and employers' organisations shall enjoy adequate protection against any acts of interference by each other or each other's agents or members in their establishment, functioning or administration.	The right to collectively bargain is enshrined in the constitution of South Africa. Eskom will adhere to the ILO Conventions which have been ratified by South Africa.
Forced Labour Convention, 1930 (No. 29)	Aims to suppress the use of forced or compulsory labour in all its forms within the shortest possible period.	The constitution of South Africa states that no one may be subjected to slavery, servitude or forced labour. Eskom will adhere to the ILO Conventions which have been ratified by South Africa.
Abolition of Forced Labour Convention, 1957 (No. 105)	Undertakes to suppress and not to make use of any form of forced or compulsory labour (a) as a means of political coercion or education or as a punishment for holding or expressing	The constitution of South Africa states that no one may be subjected to slavery, servitude or forced labour.

GUIDELINE	REFERENCE	APPLICABILITY
	political views or views ideologically opposed to the established political, social or economic system; (b) as a method of mobilising and using labour for purposes of economic development; (c) as a means of labour discipline; (d) as a punishment for having participated in strikes; (e) as a means of racial, social, national or religious discrimination.	Eskom will adhere to the ILO Conventions which have been ratified by South Africa.
Minimum Age Convention, 1973 (No. 138)	Seeks to ensure the effective abolition of child labour and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.	The Basic Conditions of Employment Act in South Africa states that it is a criminal offence to employ a child younger than 15. Eskom will adhere to the ILO Conventions which have been ratified by South Africa.
Worst Forms of Child Labour Convention, 1999 (No. 182)	To secure the prohibition and elimination of the worst forms of child labour as a matter of urgency.	The Basic Conditions of Employment Act in South Africa states that it is a criminal offence to employ a child younger than 15. Eskom will adhere to the ILO Conventions which have been ratified by South Africa
Equal Remuneration Convention, 1951 (No. 100)	To ensure the application to all workers of the principle of equal remuneration for men and women workers for work of equal value.	The Employment Equity Act states that no person may discriminate directly or indirectly against an employee on the basis of race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language and birth or on any other arbitrary grounds. Eskom will adhere to the ILO Conventions which have been ratified by South Africa
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	To declare and pursue a national policy designed to promote, equality of opportunity and treatment in respect of employment and occupation.	The Employment Equity Act states that no person may discriminate directly or indirectly against an employee on the basis of race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language and birth or on any other arbitrary grounds. Eskom will adhere to the ILO Conventions which have been ratified by South Africa

GUIDELINE	REFERENCE	APPLICABILITY
Occupational Safety and Health Convention, 1981 (No. 155)	Employers shall be required to ensure that the workplaces, machinery, equipment and processes under their control are safe and without risk to health.	The Occupational Health and Safety Act seeks to provide for the health and safety of people at work or in connection with the use of plant and machinery. Eskom will adhere to the ILO Conventions which have been ratified by South Africa

2.5 LEGISLATIVE GAP ANALYSIS

The key requirements for the WB ESS against the South African legislation is indicated in **Table 2-7**. The limitations in the South African legislation are highlighted and measures are proposed.

Table 2-7: Key requirements of WB ESS against the South African legislation

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
ESS 1: 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	Applicable South African Legislation: — National Environmental Management Act (No. 107 of 1998) — Chapter 24: Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment. — Related provisions in the EIA Regulations: — Prescribe the regulatory process necessary to apply for environmental authorisation with offsets legislated for as required.	None

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
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		
ESS 2: 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. — To provide project workers with accessible means to raise workplace concerns.	Applicable South African Legislation: — Occupational Health and Safety Act, (Act No. 85 of 1993): — Provides for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work. — An OHS management system will need to be implemented for the Project, which will include measures during the design phase, as well as the procurement, and management of the Contractor for construction activities, in terms of the Construction Regulations (GN No. R. 84 of 7 February 2014) under the OHSA. — Basic Conditions of Employment, (Act No. 75 of 1997): — Gives effect to the right to fair labour practices referred to in section 23(1) of the Constitution by establishing and making provision for the regulation of basic conditions of employment. — Labour Relations Act, (Act No. 66 of 1995): — Gives effect to section 27 of the Constitution. — Promote and facilitate collective bargaining at the workplace and at sectoral level. — Regulates the right to strike and the recourse to lockout in conformity with the Constitution. — Promotes employee participation in decision-making through the establishment of workplace forums. — Provides simple procedures for the resolution of labour disputes. — Compensation for Occupational Injuries and Diseases Act, (Act No 130 of 1993): — Provides for compensation for disablement caused by occupational injuries or diseases sustained or contracted by employees in the	None

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
	course of their employment, or for death resulting from such injuries or diseases. — Employment Equity Act, (Act No. 55 of 1998): — Promotes equal opportunity anf fair treatment in employment through elimination of unfair discrimination and implementing affirmative action measures to redress the disadvantages in employment experienced by designated groups — Promotion of Equality and Prevention of Unfair Discrimination Act, (Act No. 4 of 2000): — To prevent and prohibit unfair discrimination and harassment. — To promote equality and eliminate unfair discrimination. — To prevent and prohibit hate speech.	
ESS 3: 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.	Applicable South African Legislation: — National Environmental Management Act (No. 107 of 1998) — National Environmental Management: Waste Act (59 of 2008) (NEM:WA) — National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) — National Environmental Management Protected Areas Act (No. 57 of 2003) — The National Water Act (No. 36 of 1998) — Mineral and Petroleum Resources Development Act (No. 28 of 2002) — Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989) — Conservation of Agricultural Resources Act (No. 43 of 1983) — Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) Measures related to resource efficiency (including use of energy, water and raw material) are inherently catered for in the above legislation.	None
ESS 4: 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	Applicable South African Legislation: — Occupational Health and Safety Act (No. 85 of 1993): — Makes provision for managing health and safety hazards to public safety that are	None

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
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. — 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.	created as a result of work or work-related activities.	
ESS 6: 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. — To promote the sustainable management of living natural resources. — To support livelihoods of local communities, including Indigenous	Applicable South African Legislation: — National Environmental Management Act (No. 107 of 1998) — National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) — National Environmental Management Protected Areas Act (No. 57 of 2003) — The National Water Act (No. 36 of 1998) — Conservation of Agricultural Resources Act (No. 43 of 1983) — Protection, Promotion, Development and Management of Indigenous Knowledge Act 6 of 2019	ESS 6 ensures that the protection of local communities is accounted for when undertaking a biodiversity assessment.

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.		
ESS 8: 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: — 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.	Applicable South African Legislation: — The National Heritage Resources Act (No. 25 Of 1999): — Promotes good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be handed down to future generations.	None
ESS 10: 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	Applicable South African Legislation: — National Environmental Management Act (No. 107 of 1998) — Chapter 24: Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment. — Chapter 6 of the EIA Regulations: — Seeking consent for an activity on land owned by person other than proponent. — Explaining the purpose of public participation. — Prescribing the public participation process. — Prescribing the registration of I&APs and their rights to comment on reports and plans.	None

WB ESS REQUIREMENTS	RELATED SOUTH AFRICAN LEGISLATION	LIMITATIONS
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.		

3 SCREENING METHODOLOGY

3.1 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. This Screening Report is based on the findings from the DFFE. The sensitives identified in the Screening Report is not a complete list. Refer to **Section 8** for the environmental and social sensitives as identified by the specialists.

3.1.1 FINDINGS FROM THE DFFE SCREENING REPORT FOR THE SOLAR PV AND BESS PROJECT

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** Error! Reference source not found.. 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 assessment 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				✓

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVIY
Civil Aviation (Solar PV) Theme			✓	
Defence Theme				✓
Landscape (Solar) Theme	✓			
Palaeontology Theme	✓			
Plant Species Theme			✓	
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 ESIA report as determined by the screening tool (please refer to Section 4.2.1 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.

Four of the identified specialist studies will not be undertaken as part of the 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 Process as this will be undertaken during the detailed design phase. A desktop geotechnical study has been undertaken and is included in **Appendix** Error! Reference source not found..

- **RFI Assessment**

  A RFI Study will not be undertaken. The proposed development area is not located within any Astronomy Advantage Area. The South African Weather Service (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 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.

3.1.2 FINDINGS FROM THE DFFE SCREENING REPORT FOR THE WEF PROJECT

A screening report for the proposed Eskom WEF Project was generated from the website on 27 June 2022 and is attached as **Appendix** Error! Reference source not found.**.** 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 assessment 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 3-2 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 (Wind) Theme				✓
Bats (Wind) Theme		✓		
Civil Aviation (Solar PV) Theme		✓		
Defence Theme				✓
Flicker Theme	✓			
Landscape (Wind) Theme	✓			
Palaeontology Theme	✓			
Noise Theme	✓			

THEME	VERY HIGH SENSITIVITY	HIGH SENSITIVITY	MEDIUM SENSITIVITY	LOW SENSITIVIY
Plant Species Theme			✓	
RFI (Wind) 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 ESIA report as determined by the screening tool (please refer to Section 4.2.1 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;
- Avian Impact Assessment;
- Civil Aviation Impact Assessment;
- Defence Assessment;
- RFI Assessment;
- Noise Impact Assessment;
- Flicker Assessment;
- Traffic Impact Assessment;
- A Geotechnical 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 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 Process as this will be undertaken during the detailed design phase. A desktop geotechnical study has been undertaken and is included in **Appendix** Error! Reference source not found..

- **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 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.

3.1.3 ADDITIONAL SENSIVITIES IDENTIFIED

The DFFE Screening Tool does not identify all sensitivities related to the project. Additional potential sensitivities have been identified in terms of the WB ESF and included in **Table 3-3**.

Table 3-3: Additional sensitivities identified

THEME	SENSITIVITY RECEPTORS
Social Theme	— Gender based violence; — Security issues; — Child and forced labor; — Risk to vulnerable and marginalized groups; — Indigenous people; — Community health and safety; — Occupational health and safety; — Jobs loss/creation; and — Influx of people.

The proposed Socio-Economic specialist assessment covers all the additional identified sensitivities as required by the WB ESF.

3.2 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.

3.3 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 Final ESIA 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 for the Draft ESIA. The screening tool is based on two criteria, namely probability; and consequence (**Table 3-4),** 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 3-5** and **Table 3-6** respectively.

Table 3-4 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 3-5 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 3-6 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.

SCORE	NEGATIVE	POSITIVE
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 3-7**) has been applied according to the nature and significance of the identified impacts.

Table 3-7 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

3.4 ASSUMPTIONS 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 ESIA documentation; and

- The comments received in response to the public participation process, will be representative of comments from the broader community.
- Limitations in this section are based on the preliminary studies undertaken and will be updated when the final ESIA phase reporting is undertaken.

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 ESIA 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.

Contaminated Land:

- The preliminary risk assessment is based on potential source-pathway-receptor linkages (exposure pathways) applicable under specific land-use assumptions. Should the source-pathway-receptor linkages be altered, or the applicable land-use/s change, re-assessment may be necessary as the outcomes of the current assessment may no longer be valid. Moreover, the limitations associated with the finite nature of the intrusive works conducted should be recognised and the presence of other areas of impact that have not been identified during the current scope cannot be discounted. The preliminary quantification exercise has been conducted in targeted areas only and more detailed works will likely be necessary to validate the findings.
- Whilst broadly complying with Part 8 of the NEM: WA, the report does not constitute a Site Assessment Report (SAR) as described thereunder.
- There is information on the depth of the existing and proposed undermining activities. Based on the available information, the coal seams being targeted for mining are located at depths of between 20 to 100 m. It is understood that additional geotechnical investigations will be carried out by Eskom to provide further clarity.

4 STAKEHOLDER ENGAGEMENT

Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks.

Stakeholder engagement comprises 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 process. Effective stakeholder 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:

- Identifying the different categories such as various levels of government, customary authorities, industry, directly affected communities Non-governmental organisations etc, of stakeholders who may be affected by or interested in the proposed project;
- Identifying specific individuals or organisations within each of these categories taking into account the geographic area where impacts may be experienced and the nature of potential impacts and potentially interested groups;
- 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.

In accordance with the NEMA, GNR 982, as amended, Chapter 6, the following activities have taken place or are proposed to take place.

A comprehensive and inclusive stakeholder engagement plan (SEP) has been developed by Urban-Econ (Urban-Econ, June 2022) which takes into consideration the scale of the shutdown of Komati Power Station and its subsequent repurposing. The SEP is therefore envisaged to guide the participation of various stakeholders throughout the life-cycle of the project and its respective components to ensure an inclusive approach to mitigating environmental and societal risks.

This Stakeholder Engagement Process is being undertaken as a separate process to this ESIA.

4.1 WHAT IS AN INTERESTED AND AFFECTED PARTY?

An interested and affected party (I&AP) is defined as any person, group of persons or organisations interested in or affected by an activity, and any organ of state that may have jurisdiction over any aspect of the activity.

- The difference between an I&AP and a registered I&AP:
  - An I&AP can be directly or indirectly impacted on by a proposed activity
  - A registered I&AP is a person whose name has been placed on the register of registered I&APs. According to the PPP Guidance document, 2017, only registered I&APs will be notified:
  - Of the availability of reports and other written submissions made to the CA by the Applicant; and
  - Of the outcome of the application, the reasons for the decision, and that an appeal may be lodged against a decision.

For the purpose of this report, registered I&APs will be referred to as Stakeholders. Once stakeholders were identified a qualitative analyses was applied to determine the level of engagement necessary to appropriately include them. This analysis allows for the informed planning of how to focus engagement efforts and helps

identify the key objectives of engagement with different parties. Stakeholder groups that will be engaged with through the development of the ESIA studies are briefly described in **Table 4-1.**

Table 4-1: Preliminary Stakeholder Analysis

STAKEHOLDER CATEGORY	STAKEHOLDERS	LEVEL OF ENGAGEMENT REQUIRED
Competent Authority	DFFE	Central government individuals are of high importance due to the fact that they manage the various permitting requirements associated with the project
Commenting Authorities	— Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs — Department of Mineral Resources and Energy — Mpumalanga DWS — Mpumalanga Department Agriculture, Rural Development, Land and Environmental Affairs — Department of Rural Development and Land Reform — Mpumalanga Department of Water and Sanitation: Oliphant's Proto-CMA — Mpumalanga Department of Social Development — Mpumalanga Department of Public Works, Roads and Transport — Mpumalanga Department of Co-Operative Governance and Traditional Affairs — Mpumalanga Heritage Resources Authority — Department of Defence Force Mpumalanga — South African Heritage Resource Agency — Transnet Freight Rail — Eskom — BirdLife South Africa — South African National Biodiversity Institute — Mpumalanga Tourism and Parks Agency	Commenting authorities are important to the proposed project due to the fact that they provide leadership and services to the various district and municipal councils. The Regional and Local Government individuals also act as representatives of the various communities within their jurisdiction.
Customary authorities	Includes local community leaders and representatives.	Local community leaders and religious or educational leaders act as representatives of their local community. It is important to keep these stakeholders closely involved and well informed.

STAKEHOLDER CATEGORY	STAKEHOLDERS	LEVEL OF ENGAGEMENT REQUIRED
Project-affected communities and households	Includes all members of communities affected by proposed project.	Households and communities that will experience impacts (positive or negative) as a result of the proposed project. Vulnerable groups may be affected by the proposed project. They may also have difficulty in engaging with the stakeholder consultation process and thus may not be able to fully express their concerns regarding the proposed project. Vulnerable groups may have differentiated impacts and may require special consultation on differentiated measures.
Industrial and commercial stakeholders	Industrial / commercial organization affected by the porpsoed project. This includes commercial farms and potentially other industrial sites.	Individuals or organisations with potential economic interest in the proposed project. This may be through gaining contracts with the proposed project or due to economic impacts caused by the project. It will be important to meet the needs of these stakeholders as they arise.
Non-governmental organisations (NGOs) at national and regional levels	Relevant NGOs in the fields of conservation, social development and human rights.	Organisations with direct interest in the proposed project and that are able to influence the project directly or through public opinion. Such organisations may also have useful data and insight and may be able to become partners to the project in areas of common interest. It is anticipated that some international NGOs will have an interest in the proposed project. It will be important to meet the needs of these stakeholders as they arise.
Others	Research/Academic Institutions, churches	Other international, regional and local groups with direct interest in the proposed project. It will be important to meet the needs of these stakeholders as they arise.

4.2 RIGHTS, ROLES AND RESPONSIBILITIES OF THE STAKEHOLDER

In terms of Chapter 6, specifically Section 43(1) of the NEMA EIA Regulations 2014, as amended, registered stakeholders have the right to bring to the attention of the CA any issues that they believe may be of significance to the consideration of the application. The rights of stakeholders are qualified by certain obligations, namely:

- Stakeholders must ensure that their comments are submitted within the timeframes that have been approved by the DFFE, or within any extension of a timeframe agreed by the proponent, EAP or CA;
- Disclose to the EAP any direct business, financial, personal or other interest that they might have in the approval or refusal of the application;

The roles of stakeholders in a public participation process usually include one or more of the following:

- Assisting in the identification and prioritisation of issues that need to be investigated;
- Making suggestions on alternatives and means of preventing, minimising and managing negative impacts and enhancing proposed project benefits;
- Assisting in or commenting on the development of mutually acceptable criteria for the evaluation of decision options;
- Contributing information on public needs, values and expectations;
- Contributing local and traditional knowledge; and
- Verifying that their issues have been considered.

In order to participate effectively, stakeholders should:

- Become involved in the process as early as possible;
- Register as a stakeholder;
- Advise the EAP of other stakeholders who should be consulted;
- Contribute towards the design of the public participation process (including timeframes) to ensure that it is acceptable to all stakeholders;
- Follow the process once it has been concluded;
- Read the material provided and actively seek to understand the issues involved;
- Give timeous responses to correspondence;
- Be respectful and courteous towards other stakeholders;
- Refrain from making subjective, unfounded or ill-informed statements; and
- Recognise that the process is confined to issues that are directly relevant to the application.

4.3 STAKEHOLDER IDENTIFICATION

Stakeholders will 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). Stakeholder groups that will be engaged with through the development of the ESIA studies are briefly described in **Table 4-1.**

Within the context of the ESS10, stakeholders refer to individuals or groups who are: (i) either affected or likely to be affected by the project; or (ii) may have an interest in the project. Therefore, stakeholders may have interests, may either be directly or indirectly affected by the project or may have the potential to influence the project outcomes.

As per the ESS10, Urban-Econ categorised stakeholders in the SEP into three groups. The purpose thereof is to ensure more effective and efficient stakeholder engagements. These groups are as follows:

- Directly affected parties: includes stakeholders that are directly affected or may be affected by the project's implementation.
- Other interested parties: other affected parties that may have an interest in the project.
- Vulnerable/disadvantaged groups: groups or individuals that may require alternative or more comprehensive engagement efforts due to their vulnerable status.

Stakeholders from each of the above groups have been identified in the Urban-Econ SEP (June, 2022). For full context refer to Section 8.1 of the Urban-Econ SEP.

VULNERABLE STAKEHOLDERS

Vulnerable stakeholders require special attention in accordance with international best practice requirements. Vulnerable people include those who, by virtue of their gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may be more adversely affected by a project than others, and who may be limited in their ability to take advantage of a project's development benefits.

The following groups can be seen as potentially vulnerable in the town of Komati:

- Women: a woman's accesses to resources (physical and financial) are restricted due to traditional and cultural practices. Women were identified to have low representation in community level decision making;
- Single-headed Households, including female and child-headed households: Single headed households are identified as households where the head of the household is both the primary income source as well as the caregiver. This group is particularly vulnerable due to reduced access to income generating opportunities and higher levels of food insecurity;
- Elderly: The elderly within the villages are less likely to receive an income and are reliant upon other members of a household. It should be noted that elder men have an elevated status and play a prominent role in traditional institutions and community level decision making;
- Children: Children are mainly reliant upon older members of the household to access resources and for the maintenance of their general wellbeing;
- Child Headed households: Child Headed Households are identified as the most vulnerable group as children are dependants, and not providers, such households are often incapable of generating adequate income or providing the care or protection that parents traditionally provide;
- Households with low income; and
- People with Physical / Mental Health Illnesses and Disabilities: The project area has no institutional systems or services to encourage the economic and social participation of disabled stakeholders in the community.

In addition to the above, Urban-Econ identified the following vulnerable groups as part of their SEP:

- Women and the elderly;
- Minority groups;
- Child-headed households;
- Disabled individuals and
- Unskilled/illiterate individuals.

For full context refer to Section 8.1 of the Urban-Econ SEP.

4.4 PREVIOUS STAKEHOLDER ENGAGEMENT

The shutdown of Komati Power Station has been the focus of two core studies, the first being the investigation into the repurposing and repowering potential of Komati Power Station undertaken by VPC (2021) and the second on the socio- economic implications of the Komati Power Station shutdown and mitigation measures to reduce the identified impacts by Urban-Econ (2022).

Stakeholder engagements were conducted in two phases with respect to the Urban-Econ (2022) study. The first was largely centred around the gathering of information/data from various parties of relevance in the region or who were considered as significantly related to the shutdown of Komati Power Station. This information was mainly used to inform the situational analysis concerning Komati Power Station, inform the shutdown implications and identify possible mitigation measures. During this phase, the outcomes of the study were not communicated to the various stakeholders.

During the second phase of the Urban-Econ (2022) study, engagements were again following the same approach as in the first phase. However, the purpose of some engagements was to present the key findings and outcomes of the study (of which the anticipated socio-economic impacts of the Komati Power Station shutdown and proposed mitigation measures were the most important). As part of these engagements, stakeholders were provided with an opportunity to voice their concerns and contribute to the proposed mitigation measures. In addition to the above, a study was undertaken to investigate the repowering and repurposing potential of Komati Power Station by VPC (2021). Although extensive stakeholder engagements were not undertaken as part of the VPC (2021) study, those that were indeed undertaken will be incorporated into the SEP. Crucially, the VPC (2021) study identified several stakeholders across various groups that would need to be consulted as the shutdown of Komati Power Station commences and its repurposing progresses.

The SEP builds on the previous stakeholder engagements undertaken as part of both the Urban-Econ (2022) and VPC (2021) studies, with new stakeholders that did not participate in the mentioned studies included as part of the SEP. Different stakeholders in the project and how they are to be engaged with will be discussed in the following sections.

Apart from the above, Eskom has also undertaken extensive engagements with several stakeholders on the repowering and repurposing of Komati Power Station, and Eskom's JET.

For full context refer to Section 7 of the Urban-Econ SEP.

4.5 PUBLIC PARTICIPATION FOR DRAFT ESIA PHASE

Extensive stakeholder engagement has already been undertaken by Eskom and Urban-Econ for the Shutdown and Repurposing of Eskom Power Stations (Refer to the Urban-Econ SEP (June 2022)) to notify Ward Councillors, Ward Committee Members and acknowledged representatives from various community groups who would be impacted by the shutdown of their Hendrina, Grootvlei, and Komati Power Stations which are approaching the end of their operational life.

WSP will formally announce the commencement of the Process for the application of an EA for the proposed establishment of a Solar PV, BESS and WEF facilities at Komati Power Station, and request I&APs to register their interest in the project. **Table 4-2**, below provides an overview of the stakeholder engagement that has been undertaken during the Draft ESIA Phase. Stakeholder engagement is a continuous process and the stakeholder engagement that will be undertaken by WSP for the remainder of the ESIA phase is detailed in **Section 11.6**.

Table 4-2 Notification Methods

NOTIFICATION	ACTIVITIES
Notice will be given to the public by publishing newspaper adverts	Adverts were published in in two newspapers, the Highvelder (in English and Afrikaans) and Witbank News (in in English and IsiZulu), formally announcing the commencement of the project, requesting I&APs to register their interest in the project. Refer to **Appendix** Error! Reference source not found. for proof.

NOTIFICATION	ACTIVITIES
Notice will be given to the public by placing site notices at appropriate locations on site and in the surrounding area	Site Notices (in English, Afrikaans and isiZulu were placed on 09 June 2022 at the following places: — Komati Power Station Entrance — Boundary/access road to the Solar PV Site A and B — Blinkplan Police Station; — OK Foods Super Market; — Komati Paypoint and Library; — Nkangala District Municipality (NDM) Office; — Gerard Sekoto Library; — Eastdene Public Library; and — Hendrina Public Library. Refer to **Appendix** Error! Reference source not found. for proof. Additional venues for the placement of notices such as garages, churches and shops will be considered if permission is granted by the owners of these venues. The notices formally announced the commencement of the project, requesting I&APs to register their interest in the project.
Focus group meetings	A focus group meeting was held at Komati Power Station on 09 June 2022 for community representatives, stakeholder forums and NGOs for discussion on the proposed establishment of a Solar PV and BESS Facility at Komati Power Station. Additional public engagement and focus group meetings are planned as part of the Final ESIA Phase. Refer to **Appendix** Error! Reference source not found. for the Meeting Register and Meeting Notes. Comments and concerns raised during this meeting have been included in **Section 4.6**.

4.6 ISSUES IDENTIFIED DURING FOCUS GROUP MEETING

A focus group meeting was held by Eskom and WSP at Komati Power Station on 09 June 2022 for community representatives, stakeholder forums and NGOs for discussion on the proposed establishment of a Solar PV and BESS Facility at Komati Power Station. Stakeholders were informed of the meeting via telephonic calls, emails and SMSs.

The meeting was attended by nine stakeholders; two virtually (MS Teams) and seven in person. Of the nine attendees, five were female and four were male. Refer to **Appendix** Error! Reference source not found. for the Meeting Register and Meeting Notes.

Comments and concerns raised during this meeting by stakeholders have been included in **Table 4-3.** Comments were responded to during the meeting were possible and additional information will be provided to the stakeholders via email and telecommunication.

Table 4-3: Comments and Responses Received at Focus Group Meeting

STAKEHOLDER DETAILS	COMMENT	RESPONSE
Anna Marth Ott – Middleburg Chamber of	What happens in Komati will impact the whole country therefore it is important to repurpose the power station otherwise we will have an economic crisis on our hands. How do we go about getting a	Renewable Energy Development Zones (REDZ) are geographical areas where wind and solar photovoltaic power development can occur in concentrated zones. The REDZs were

STAKEHOLDER DETAILS	COMMENT	RESPONSE
Commerce and Industry	REDZ allocated to the area? Hendrina is the next power station to be decommissioned and the power stations fall outside the REDZ.	identified through the undertaking of two Strategic Environmental Assessments by the DFFE, the first being finalised in 2015 and the second being finalised in 2019. The development of a wind or solar PV project within the REDZ allows for reduced environmental authorisation timeframes. REDZ are allocated at a strategic level by the DFFE.
	It was mentioned that the BESS parts will arrive already assembled. This is a concern as we need to be creating jobs in the area. We would like to establish a local manufacturing facility for solar plants including the manufacturing of batteries in the Komati area. How do we go about doing this? This will mitigate the negative impact of the closure of the Komati Power Station. The other concern is baseload as this will still be needed for major industries. We do not want the green energy to take away the base load required for major industries.	With regard to the Base Load, Eskom is aligned with the Integrated Resource Plan which requires power stations to shut down at 50 years. The DMRE are accountable to ensure that energy security is sustained through the energy planning process and ensuring additional capacity is added to the grid.
	This Project needs to be linked to the Master Steel Plan and localisation initiatives that are being driven for the region.	Jobs and business opportunities will be catered for as per the Just Energy Transition Plan and relevant commercial requirements
	What re-skilling will be done? Unless there is an end goal of a job opportunity, there is no point in re-skilling people. On the other hand, for businesses to survive, they need to be able to take their own future in their hands and continuous handouts will also not help.	Jobs and business opportunities will be catered for as per the Just Energy Transition Plan and relevant commercial requirements
	The scope of the Urban-Econ study was not wide enough. The study seemed to only look at the Komati area and not at the bigger municipal area. This will be necessary to get an idea of the actual economy of the municipality. Could a copy of the Urban-Econ study be made available?	The report is not yet finalised. The final report will be shared as soon as it is available.
Alta de Bruin - Villa Rosa Guesthouse Owner	A local manufacturing facility must be in Komati and not in Middelburg. The problem is here in Komati. There is a need to create work for the people here.	Jobs and business opportunities will be catered for as per the Just Energy Transition Plan and relevant commercial requirements
	What are the project timeframes? The community cannot wait three years for the project to start, there are no jobs. Training should start now.	The Environmental and Social Impact Assessment studies are underway and are estimated to be finalised in 15 months from the month of May 2022. Once the Environmental Authorisation is obtained and final designs are completed construction would be able to start. The estimated construction start date is 2024 and to be completed in 2027. The dates are for planning purposes; more accurate dates will be indicated by the construction schedule once the contractor/s is appointed.

STAKEHOLDER DETAILS	COMMENT	RESPONSE
Collins Nyamadzawo Mpumalanga Green Cluster Agency	Regarding the issue of localisation and producing batteries and solar panels, has Eskom decided on the battery technology that will be used and the battery manufacturer that will be used? It has been noted that the solar panels will occupy 75 hectares of the available land which is only a quarter of the available land. What is the reasoning behind the 100 MW cap when there is still ample land to install additional solar panels?	The EPC contractor will generate a design that will provide specifications for the BESS and Solar Panels. That will also influence the Procurement process to be followed. The project will be phased, additional capacity may be considered once the shutdown and dismantling plan is finalised. The details of the plan will be determined by the appointment of an owners engineer who will provide technical input. This ESIA will consider the technical proposals and ensure environmental considerations are integrated into the final plan.
Othaniel Sibembo -B&K Komati	Eskom needs to consider the local community for job opportunities within the project. Eskom should include local businesses such as guesthouses and transport companies that can be used for this project. If possible, Eskom should also give vendor numbers for small businesses in the area.	Jobs and business opportunities will be catered for as per the Just Energy Transition Plan and relevant commercial requirements
Simphiwe Mnisi Komati Farmbelt	How are the solar structures going to operate, will there be any noise from the solar panels	There is no operational noise emitting from the solar panels. However, there is a full suite of specialists appointed to assess how the project will impact the environment as well as the community. The specialists appointed include noise, air quality, surface and ground water quality and ecology. The noise specialist study will highlight any impacts this would mainly be during the construction phase. The specialist studies as well as the impacts identified will be made available for the public to review and provide any comments or concerns, they may have.
	As a community, we are used to a Power Station that utilises coal and we have been skilled in this manner. Now that there is a transition to a different technology, we as the community would like to be upskilled so that when new jobs arises from this project, we will have the required skill set. As noted by others, local businesses should be used where possible.	Jobs and business opportunities will be catered for as per the Just Energy Transition Plan and relevant commercial requirements

5 PROJECT DESCRIPTION

The design of the Solar PV, BESS and WEF are still in the conceptual phase and will be finalised at a later stage after the appointment of the Owners Engineer. Refer to **Section 4.7** for the Project Timeframes.

5.1 SITE LOCATION

The Komati Power Station is situated about 37km from Middelburg, 43km from Bethal and 40km from Witbank in Ward 4 of the STLM located within the NDM in the Mpumalanga Province. The Solar PV facilities, BESS facilities, WEF and ancillary 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 5-4**.

5.2 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 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.

5.2.1 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 gigawatt (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.

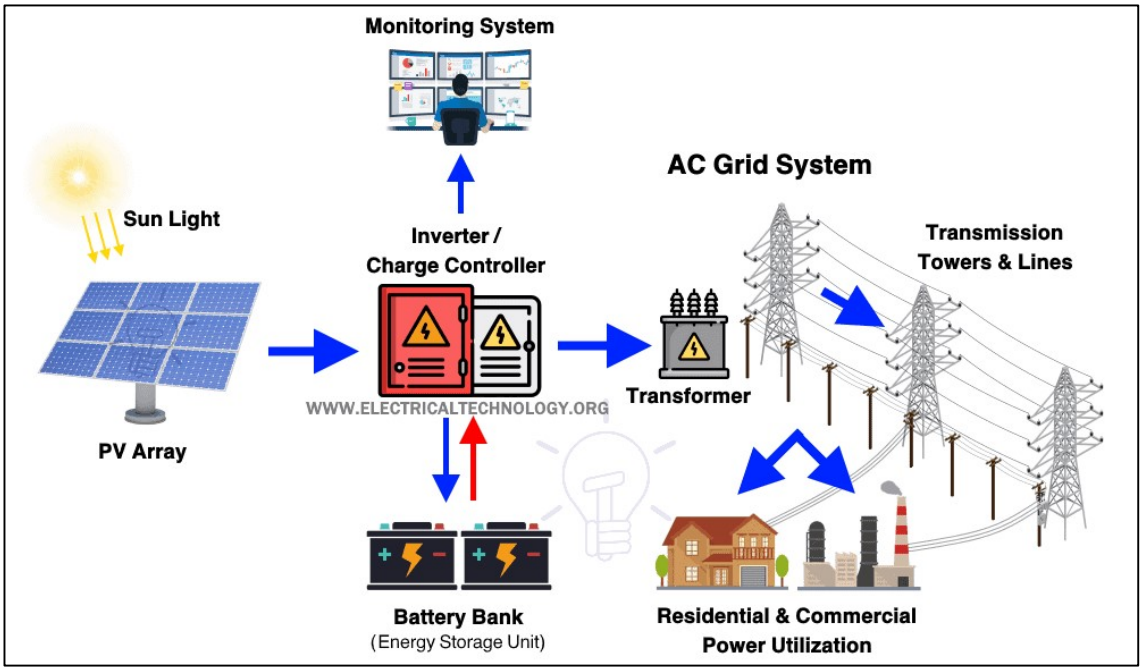
Large-scale or utility-scale PV systems are designed for the supply of commercial power into the electricity grid. Large-scale PV plants differ from the smaller units and other decentralised solar power applications because they supply power at the utility level, rather than to local users.

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 5-1** 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.

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



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

Figure 5-1: Illustration of the main components of a solar power plant

5.3 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 5-2).**

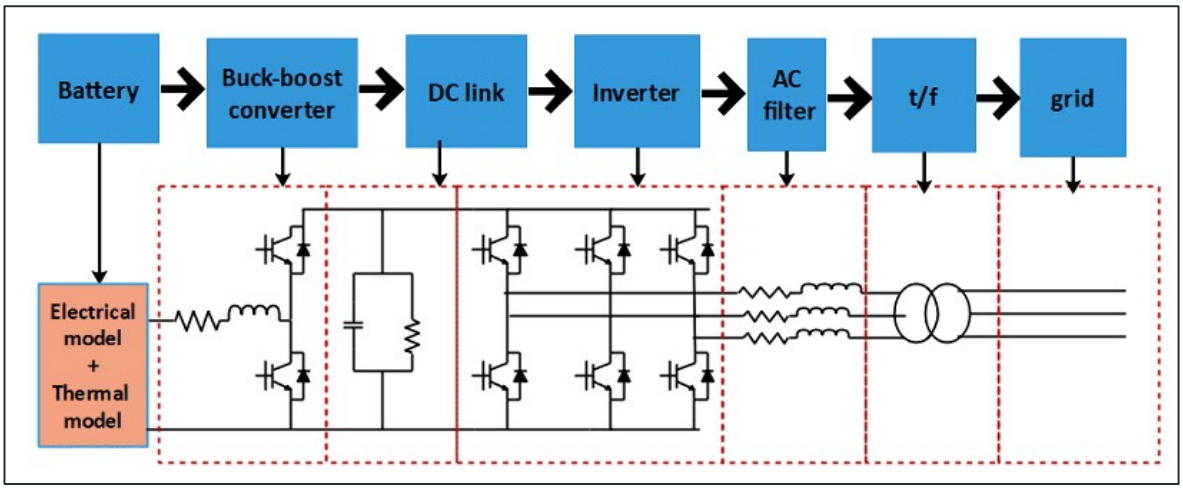


Figure 5-2: BESS components Schematic (Source: www.researchgate.net)

It is important to note that the selection of specific the BESS technology will only be determined following the appointment of the Owners Engineer.

5.4 WIND ENERGY POWER GENERATION PROCESS

Wind power is the conversion of wind energy into a useful form of energy, such as electricity, using modern and highly reliable wind turbines. Wind Power is non-dispatchable, meaning that for economic operation, all the available output must be taken when it is available.

Wind turbines, like windmills, are mounted on a tower to harness wind energy at an increased level above the ground where wind is faster and less turbulent. The kinetic energy of the wind is used to turn the blades of the turbine to generate electricity. Wind turbines can operate at varying wind speeds, with the amount of energy the wind transfers to the rotor depending on the density of the air, the rotor area and the wind speed.

The electricity generated by the wind turbines is passed through the step-up transformer and then transmitted via either underground or overhead cables to a central substation, which connects the wind energy facility to a high voltage network. Wind turbines are designed to operate automatically with minimal maintenance for approximately 20-25 years.

Figure 5-3 illustrates the following main components of a wind turbine:

- The **rotor** consists of three **blades** which are attached to a **hub**. The blades collect energy from the wind and converts the wind energy into rotational shaft motion/energy to turn the generator;
- The **nacelle** houses the equipment at the top of the tower as well as a gearbox, a generator that converts the turning motion/mechanical energy of the blades into electricity and coupling and brake;
- The **tower** supports the nacelle and rotor and allows the blades to be distanced safely off the ground so as to reach the stronger winds found at higher elevations;
- Turbine **step-up transformer** which can be indoor or outdoor, depending on the turbine model whose function is to increase the voltage capacity of the electricity generated by the turbine to a higher, grid-equivalent.
- The **foundation** unit ensures the stability of the turbine structure.

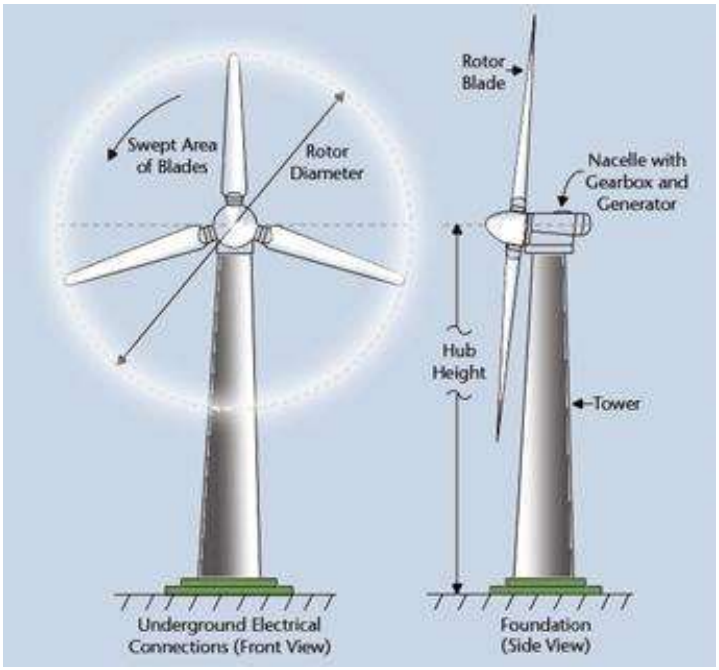


Figure 5-3: Illustration of the main components of a wind turbine

Figure 5-4: Site layout

5.5 PROJECT INFRASTRUCTURE

The proposed project will comprise the following key components:

- Solar PV Facility;
- Grid Connection infrastructure;
- Site Substation and BESS;
- Wind Turbines; and
- Ancillary infrastructure.

These components are discussed in more detail below. The Solar PV and Wind facilities are intended to evacuate power to the grid. The BESS will have dual powerlines to allow for charging from the grid power and to be able to supply electricity back into the grid when required.

The current state of this report is based on a high level concept and detailed designs will be made available at a later stage.

5.5.1 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. An additional 50MW of PV will be assessed but as this links to the decommissioning of the Ash Dam Facility which forms part of a separate ESIA, this 50MW will be completed at a later stage. The solar PV modules will be elevated above the ground, and will be mounted on either fixed tilt systems or tracking systems. 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 Operations & Maintenance (O&M) access roads in between the PV module rows. **Table 5-1** provides a high-level project summary of the proposed Facilities.

Table 5-1 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

The specifics of the technology to be used (i.e. brand and country of origin) will be provided in the Final ESIA when a detailed design is carried out.

5.5.2 WIND TURBINES

The proposed WEF is envisaged to have a capacity of up to 70 MW, depending on the wind resource available based on the wind data. Also the final capacities will be determined by energy yield studies and micro-siting. The WEF is planned for Phase I of the project and the balance of the plant on Phase II. Phase II is, however, dependant on the closure and rehabilitation of the ash dam facility.

It is anticipated that the proposed WEF will comprise the following key components, however the exact specification of these components will be determined by the final design:

- Approximately 7 turbines with a capacity of 7 MW each (the exact number will be confirmed after the micro-siting has been carried out);
- Turbine hub height ranging from 100 m – 150m;
- Rotor diameter of approximately 80m; and

— Permanent hard standing area for each wind turbine (approximately 4ha). **Figure 5-5** illustrates the typical hardstanding requirements for the construction of each turbine (it should be noted that the figure below is for illustration purposes only – the exact layout and specification of the hardstanding will be determined once the design phase has been completed).

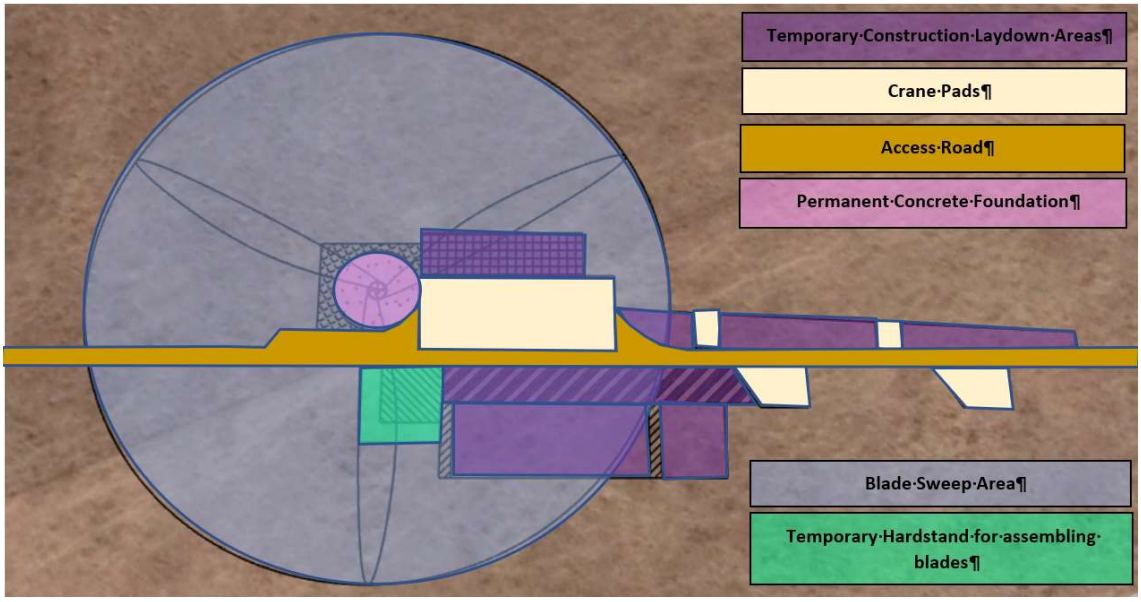


Figure 5-5: Typical Turbine Hard Standing Requirements (illustration purposes only)

The turbines will be developed on Site A (Refer to **Figure 5-4**). There is no predicted impact to the Solar PV generation process as the effect of shadowing is not expected to be permanent.

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

5.5.3 GRID CONNECTION

Each of the technologies will be individually allocated a point of connection to the Komati High Voltage (HV) yard. Each of the technology 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 distribution line 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 is 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.

5.5.4 BESS

Eskom propose 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.

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

5.5.5 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;
- 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.

5.5.6 ASSOCIATED FACILITIES

ESS1 defines the term “Associated Facilities” as facilities or activities that are not funded as part of the project and are: (a) directly and significantly related to the project; (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.

There are no Associated Facilities related to this project (Component B) in terms of ESS 1.

5.6 PROJECT ACTIVITIES

The proposed project can be divided into the following project activities:

- Construction Activities;
- Operational Activities; and
- Decommissioning Activities.

5.6.1 GENERAL CONSTRUCTION ACTIVITIES

The construction process will follow industry standard methods and techniques. The following activities will be undertaken during the construction phase:

- Establishment of the site including access roads, internal roads, site preparation; construction laydown areas and construction camps;
- Transport of components and equipment to site;
- Excavations and earthworks including levelling the ground and laying down foundations;
- The erection of PV panels and other related infrastructure;
- Construction of substation and inverters;
- Construction of wind turbines, site substation and BESS;
- Establishment of ancillary infrastructure; and
- Rehabilitation of the site after the completion of all construction activities.

The key activities associated with the construction phase are described in further detail in **Table 5-2**.

Table 5-2: Construction Activities

ACTIVITY	DESCRIPTION
Establishment access and internal roads	Internal gravel roads will be developed. The width of the access roads will be determined during the design phase.
Site preparation and establishment	Site establishment will include clearing of vegetation and topsoil at the footprint of each site, for laydown area and access routes. 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, masts, blades, tower sections, etc.), 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. The site laydown areas are expected to occur within the footprint of Site A and Site B.
Excavations and earthworks (wind turbines)	Subject to the determination of founding specifications, earthworks will be required. This is likely to entail: — Excavation of foundations and pouring of concrete foundations from the batching plant. Concrete foundations will be constructed at each site location.

ACTIVITY	DESCRIPTION
	— Levelling of the construction camp area, substation area, and O&M building area, and excavation of foundations prior to construction. — Excavation of trenches for the installation of underground cables.
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.
Construction of substation and inverters	The facility output voltage will be fed to an on-site substation where it will be fed to a collector substation that will connect to the HV Yard via existing tie-ins. Excavations will be required to lay foundations for the substations with the depths determined by the findings of the geotechnical studies.
Construction of wind turbines, site substation and BESS	A large lifting crane(s) will be required to lift the turbine sections (nacelle, blades) into place. The lifting crane/s will be brought on site and will be required to move between the turbine sites. Cranes of varying sizes may be required depending on the size of the components. An IPP substation will be constructed on the site. The BESS will typically require the placement of multiple containers to house the BESS components.
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. This will include landscaping and revegetation (grass) and paving where required.

5.6.2 OPERATIONAL ACTIVITIES

The operational process will follow industry standard methods and techniques. The following activities will be undertaken during the operational phase:

— Cleaning and maintenance of the PV Panels, Wind Turbines, overhead lines, and BESS Facilities and other ancillary infrastructure; and

— Management of waste from servicing infrastructure or due to damaged infrastructure.

The key activities associated with the operational phase are described in further detail in **Table 5-3**.

Table 5-3: Operational Activities

ACTIVITY	DESCRIPTION
Cleaning and Maintenance	During the operational phase cleaning and maintenance will be required. These activities include: — Carrying out visual inspections, repairs and servicing of PV Panels, Wind Turbines, overhead lines, and BESS Facilities and other ancillary infrastructure; — Conducting verifications of the PV and Wind system operations; — Cleaning of solar cells and PV panels on an ad hoc basis using water from the Komati Power Station Water Treatment Plant. Dry cleaning may be used if suitable solar panels are acquired when the specific brands are procured; — Regular maintenance of all thermal-based components; — Servicing of all equipment; and — Testing and upkeep of circuits.
Waste Management	All waste generated either from servicing or equipment or due to damaged infrastructure will be disposed of correctly. Disposal methods for Solar Panels, Wind Turbines and BESS facilities are still being investigated and will be further developed at the appointment of the Engineering and Procurement Contractor. All other hazardous waste will be disposed of correctly at a licenced facility.

5.6.3 DECOMMISSIONING ACTIVITIES

The decommissioning process will follow industry standard methods and techniques. The following activities will be undertaken during the decommissioning phase:

- Site preparation and establishment for decommissioning activities including construction laydown areas and construction camps;
- Transport of components and equipment to site;
- Removal and disposal of infrastructure; and
- Rehabilitation of the site after all infrastructure has been removed.

The key activities associated with the decommissioning phase are described in further detail in **Table 5-4**.

Table 5-4: Decommissioning Activities

ACTIVITY	DESCRIPTION
Site preparation and establishment for decommissioning activities	Site establishment will include clearing of vegetation and topsoil for laydown areas and access routes. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant etc). 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, masts, blades, tower sections, etc.), 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.
Removal of Infrastructure	All infrastructure no longer required will be removed from site and disposed of appropriately. Disposal methods for Solar Panels, Wind Turbines and BESS facilities are still being investigated and will be further developed at the appointment of the Engineering and Procurement Contractor. All other hazardous waste will be disposed of correctly at a licenced facility.
Rehabilitation	Once all decommissioning activities have been completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated. Rehabilitation will be based on the proposed future land use at the time.

5.6.4 WASTE MANAGEMENT

Waste Management at the project site will be undertaken in line with the ESMP to consider the correct disposal of general and hazardous waste generated on the project. **Table 5-5** describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. The majority of waste will mainly be generated during the construction and decommissioning phases.

Table 5-5: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons (Contaminated soil)	Hazardous	Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include:

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
		— Using spill kits to clean any spillages; — Ensure storage facilities are maintained and meet industry regulations; — Transportation and storage of fuel must be regulated and correctly managed according to the ESMP; — Waste generated must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	PPE can be contaminated during handling of hydrocarbons. Management options include: — Store contaminated PPE in hazardous waste skips at the project area; — Waste generated along must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Ensure contaminated Personal Protective Equipment (PPE) is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Solar Panels, Wind Turbines and BESS Components	Hazardous	During operation, solar panels, wind turbines and BESS facilities can get damaged resulting in hazardous waste. Disposal methods for Solar Panels, Wind Turbines and BESS facilities are still being investigated and will be further developed at the appointment of the Engineering and Procurement Contractor. All other hazardous waste from these components that can be disposed of, will be disposed of correctly at a licenced facility.
General waste	General	General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include: — Ensure waste is stored securely in refuse bins; — Waste generated along must be taken to the contractor laydown area at the end of each day; and — Co-ordinate waste removal with the general removal of waste from the contractor laydown area.
Food waste	General	Food waste is generated as site personnel take their meals on the construction site. Management options include: — Store any waste and packaging into a labelled food waste bin; — Waste generated along must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Co-ordinate waste removal with the general removal of waste.

5.7 PROJECT TIMEFRAMES

The project is currently in the conceptual design phase. The preliminary project timeframes are indicated in **Table 5-6**. It must be noted the timeframes above are preliminary and will be refined as the project progresses.

Table 5-6: Preliminary Project Timeframes

ACITIVITY	PROJECT	TIMEFRAME
Appointment of Owner's Engineer	PV and BESS	December 2022
	Wind	
Owner's Engineer to compile Function Specification and Scope of Work	PV and BESS	July 2023
	Wind	
Procurement and Contract Award	PV and BESS	March 2024
	Wind	July 2024
Construction	PV and BESS	March 2024 – March 2026
	Wind	August 2024 – July 2026

6 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 PV, BESS and WEF project has been considered from an international, national and regional perspective.

6.1.1 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.

6.1.2 NATIONAL PERSPECTIVE

The proposed project will pave the way for the 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 Solar and Wind facilities 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.

6.1.3 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

[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.

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. 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.

Table 6-1 Opportunities available along the solar value chain

PROJECT PLANNING	MANUFACTURING AND PROCUREMENT	INSTALLATION AND GRID CONNECTION	OPERATION AND MAINTENANCE	DECOMMISSIONING
Legal, energy regulation, real estate and taxation expects	Factory workers and technicians	Construction worker and technical personnel	Construction workers	Technical personnel and construction workers
Electrical, civil, mechanical and energy engineers	Industrial engineers	Civil engineers and foremen	Safety experts	Truck drivers and crane operators
Financial analysts	Administrative personnel	Health and safety experts	Industrial, electrical and telecommunications engineers	Industrial/mechanical/ electrical engineers
Logistic experts	Marketing and sales personnel	Electrical and mechanical engineers	Operators	Environmental experts
Environmental experts	Logistic experts	Environmental experts	Technical personnel	Safety experts
Health and safety experts	Quality control experts	Quality-control experts	Administrative and accountant personnel	Logistic experts
	Health and safety experts		Lawyers, experts in energy regulation	
	Regulation and standardisation experts		Management	
	Chemical engineers			

Source : https://cleanenergysolutions.org/sites/default/files/documents/cesc_isa_32_maximizing-value-chain.pdf

7 IDENTIFICATION OF ALTERNATIVES

7.1 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 Final ESIA phase as a baseline against which the impacts of the proposed project will be assessed.

7.2 TECHNOLOGY

The project is utilising solar, BESS and wind technology, therefore, no other technology alternatives are being considered for this project.

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.

7.3 LOCATION

The selection of the location of the proposed project is based on the close 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 Draft ESIA.

8 ENVIRONMENTAL AND SOCIAL CONTEXT

This section provides context of the current environmental and social conditions of the project area and is applicable to both the solar and the wind technologies. It highlights potential sensitive environmental and social features within the project area that will be further assessed by specialists in the Final ESIA Phase. The Plan of Study for the Specialists during the Final ESIA Phase is provided in Section 11.5.

8.1 PHYSICAL ENVIRONMENT

8.1.1 CLIMATE AND METEOROLOGY

The following is extracted from the Air Quality Impact Assessment Report the Soil and Agricultural Potential Assessment compiled by WSP and included as ***Appendix D-1 and Appendix*** *Error! Reference source not found.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 8-1**). 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 8-2**). Relative humidity was generally moderate for 2018 at 63% (**Figure 8-2**).

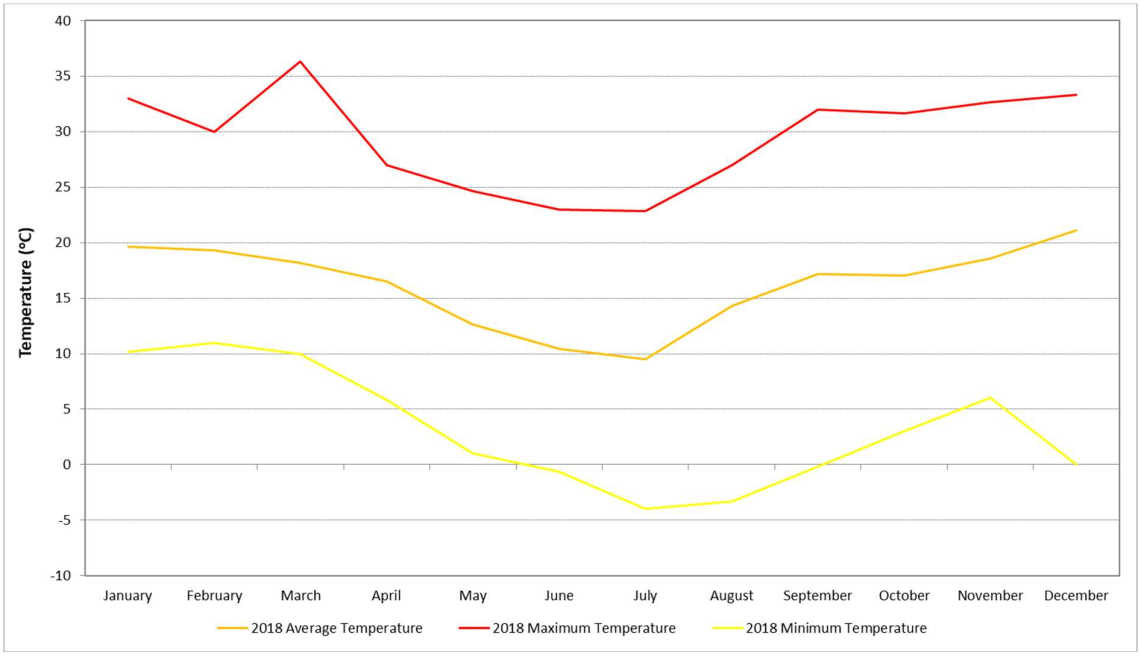


Figure 8-1: Average, maximum and minimum temperatures for the period January to December 2018 from the Komati station (SAAQIS)

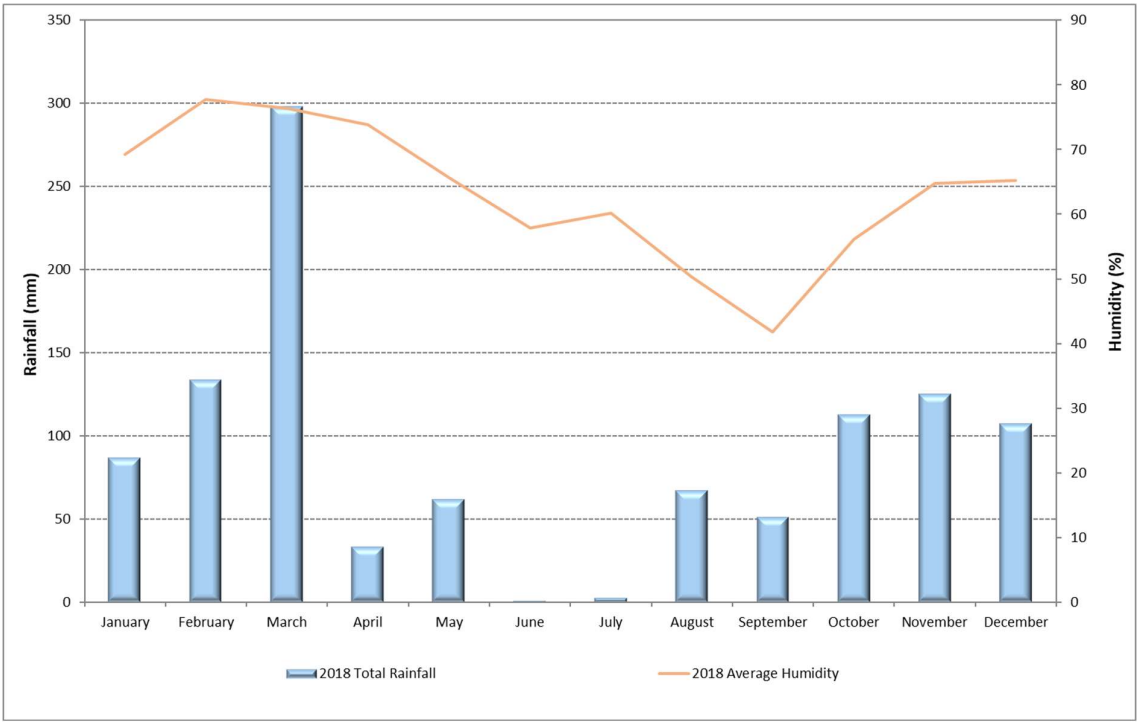


Figure 8-2: Monthly rainfall and average humidity for the period January to December 2018 from the Komati station (SAAQIS)

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 8-3** 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.

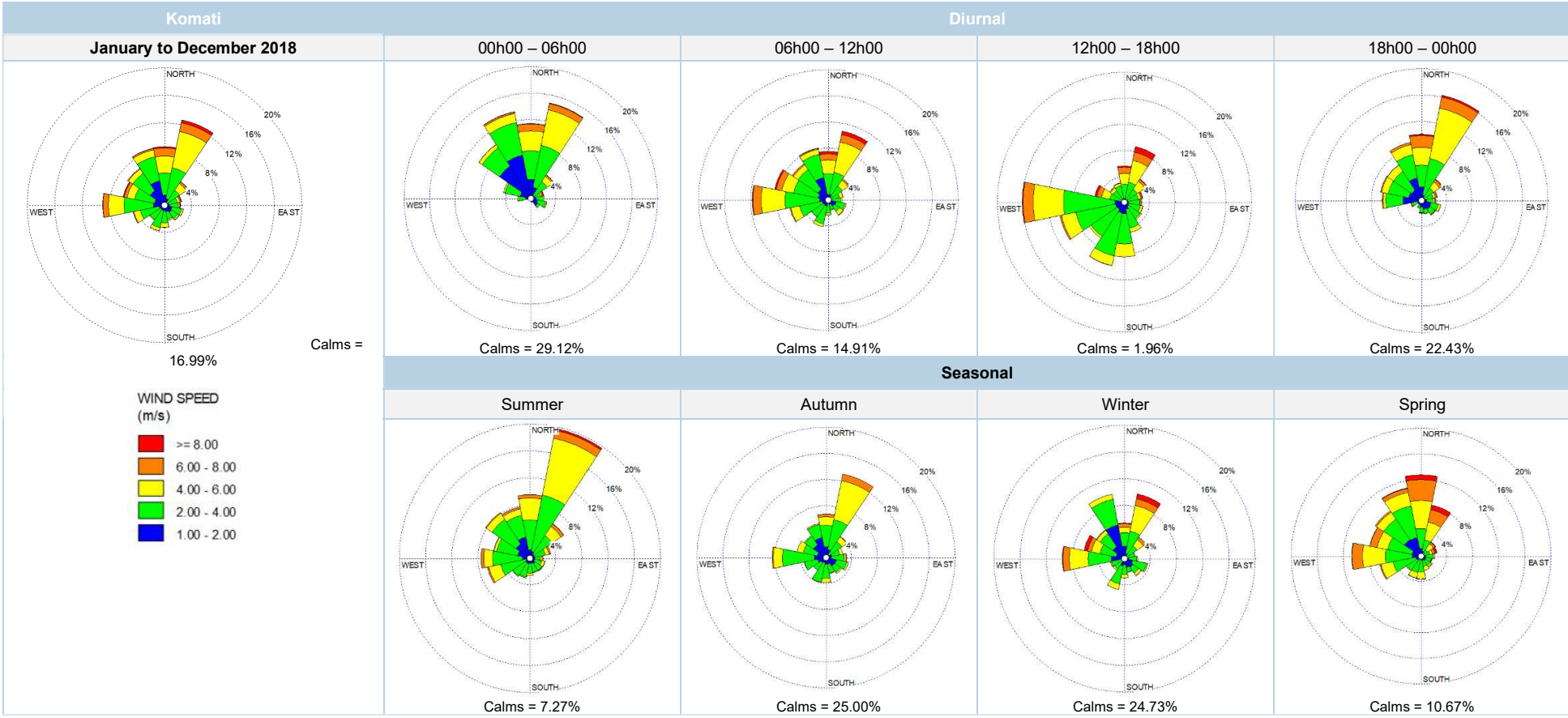


Figure 8-3: Local wind conditions for the period January to December 2018 from the Komati station (SAAQIS)

8.1.2 TOPOGRAPHY

The following is extracted from the Visual Impact Assessment compiled by LOGIS and included as ***Appendix*** *Error! Reference source not found..*

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 8-4**) 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.

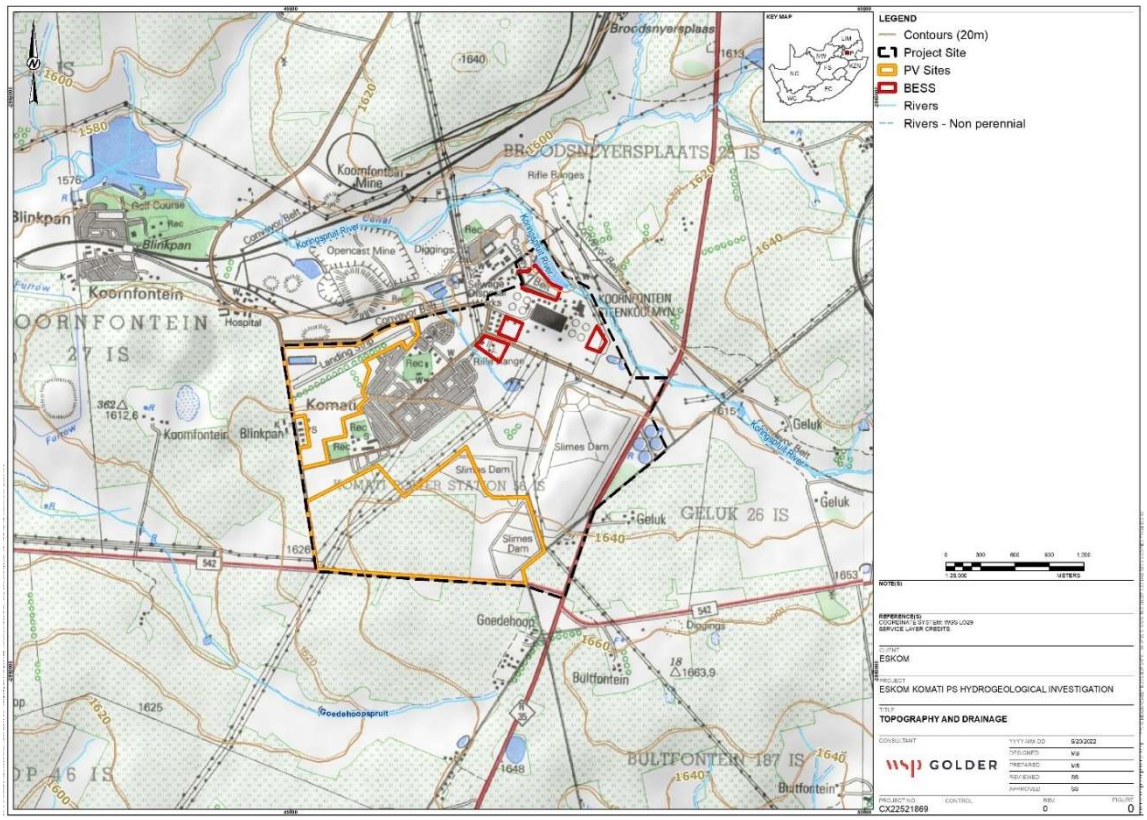


Figure 8-4: Topography

8.1.3 GEOLOGY

The following is extracted from the Palaeontology Impact Assessment compiled by Dr H Fourie and included as ***Appendix*** *Error! Reference source not found..*

Large areas of the southern African continent are covered by the Karoo Supergroup (**Figure 8-5**). 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.

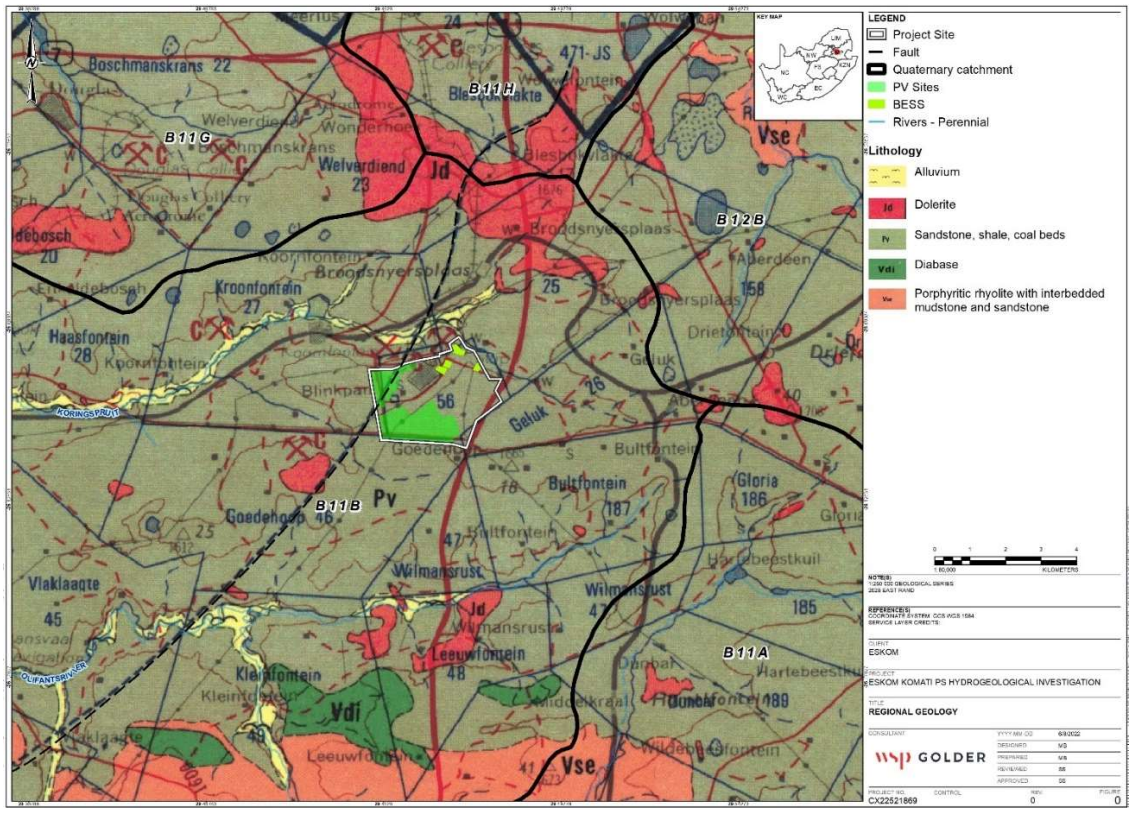


Figure 8-5: Geological map of the area

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.

8.1.4 SEISMICITY

The following is extracted from the Geotechnical Desktop Study compiled by Eskom Holdings SOC (Ltd) and included as ***Appendix*** *Error! Reference source not found..*

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 8-6 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 8-7**, 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)

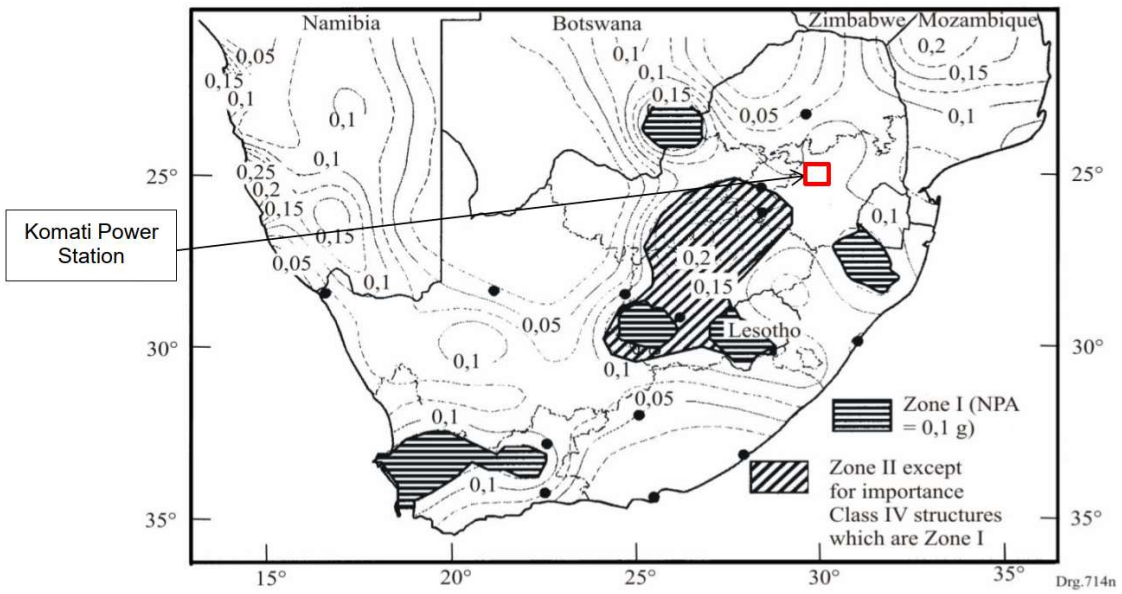


Figure 8-6: Seismic Hazard map and Zones (Source: Eskom, 2022)

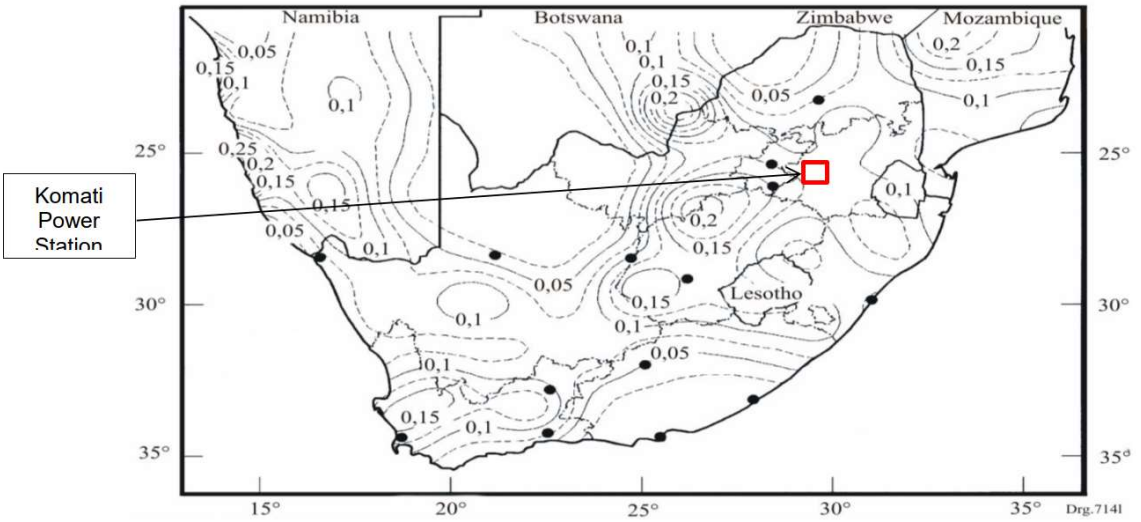


Figure 8-7: A recent seismic hazard map (2003) obtained from the Council for Geoscience (Source: Eskom, 2022)

8.1.5 AIR QUALITY BACKGROUND

The following is extracted from the Air Quality Impact Assessment Report compiled by WSP and included as ***Appendix*** *Error! Reference source not found..*

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 8-1 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 8-8**.

Table 8-1: 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

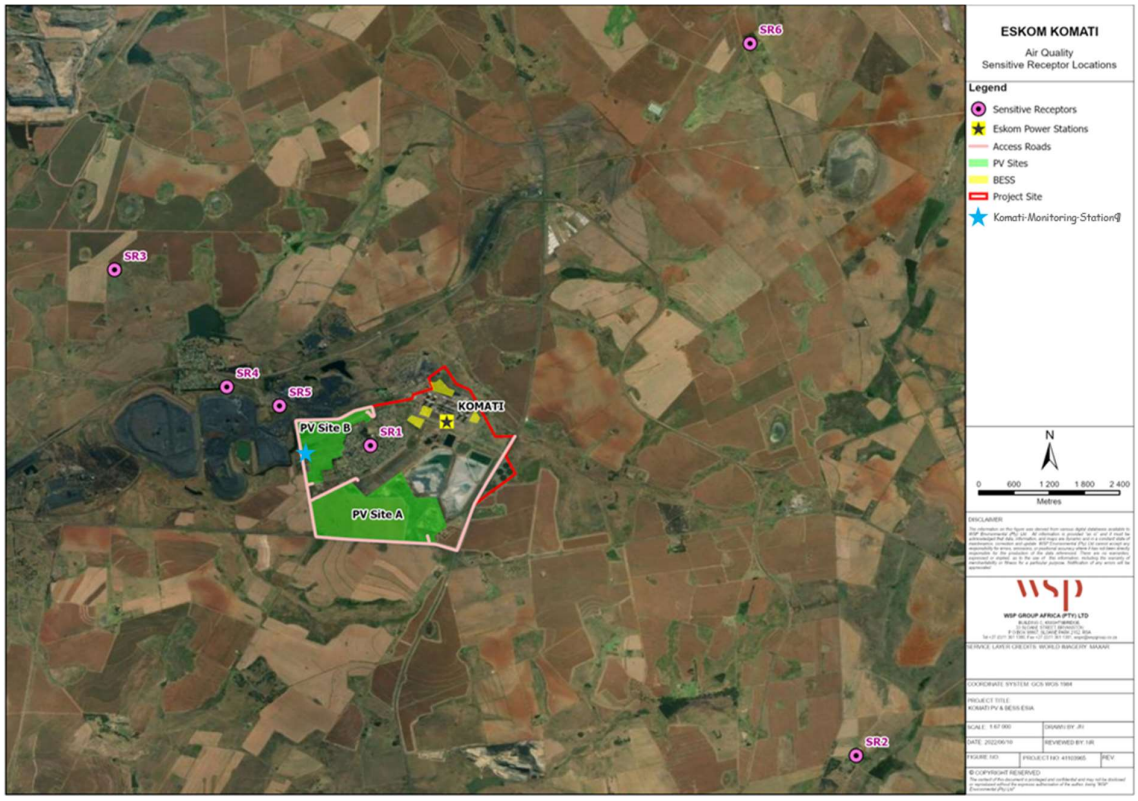


Figure 8-8: Site layout and sensitive receptors for the proposed project

8.1.6 NOISE

The following is extracted from the Noise Impact Assessment Report compiled by WSP and included as ***Appendix*** *Error! Reference source not found..*

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 8-2** and **Figure 8-9**.

Table 8-2: 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 8-9: Site layout and sensitive receptors for the proposed project

8.1.7 SURFACE WATER

*The following is extracted from the Surface Water Assessment compiled by WSP and included as **Appendix** Error! Reference source not found..*

Komati Power Station occurs within the upper Olifants Water Management Area (WMA), in the B11B quaternary catchment (**Figure 8-10**) 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.

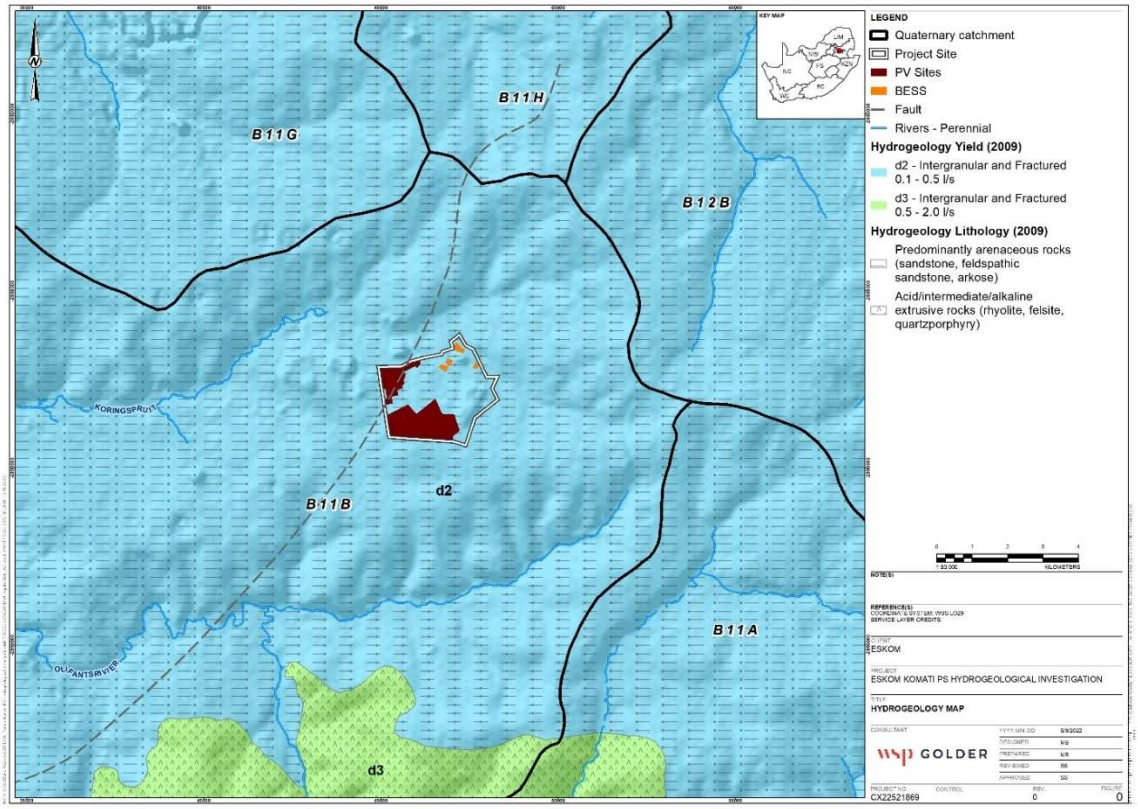


Figure 8-10: Quaternary catchment of the project area and surrounds

8.1.8 GROUNDWATER

*The following is extracted from the Groundwater Assessment and Contaminated Land compiled by WSP and included as **Appendix** Error! Reference source not found..*

The area of investigation is indicated in **Figure 8-11**.

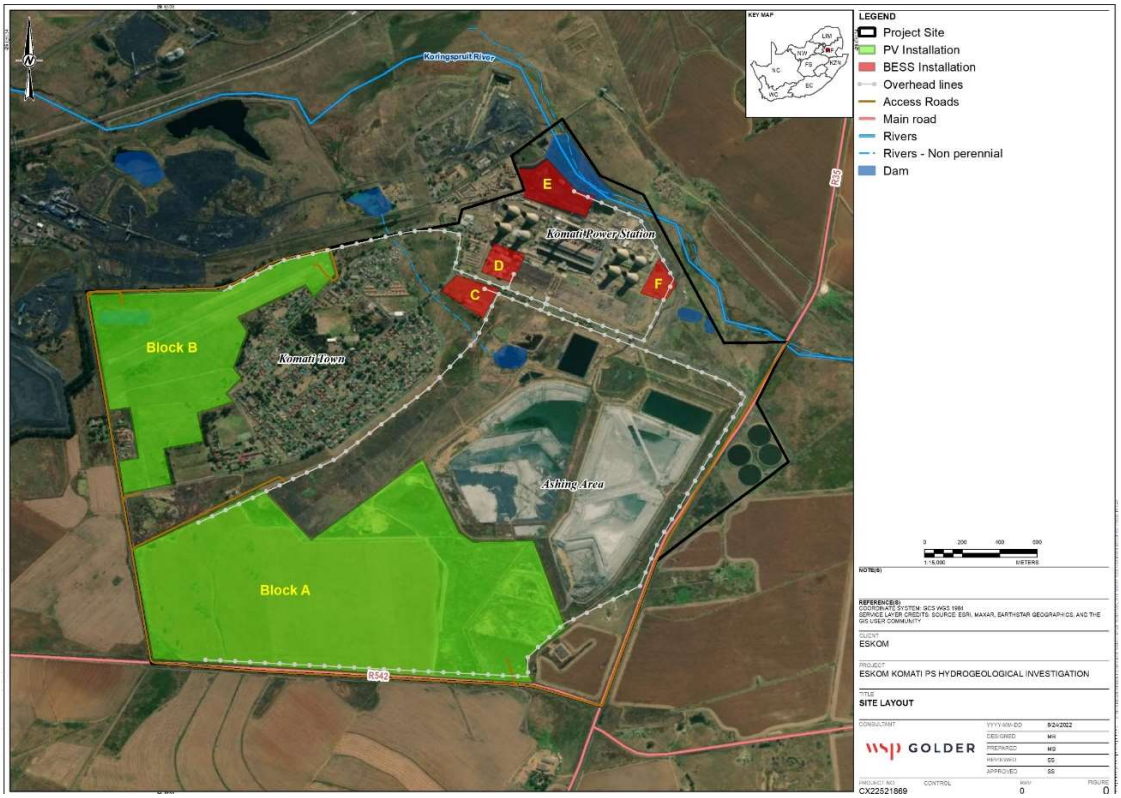


Figure 8-11: Groundwater investigation area

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 8-12**) 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 8-3**. Boreholes identified on the National Groundwater Archive were confirmed to be beyond 1 km of the farm boundary.

Table 8-3: 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
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

ID	LONGITUDE (E)	LATITUDE (S)	DEPTH (MBGL)	USE	WATER LEVEL (MBCL)	CONDITION
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 8-13**).

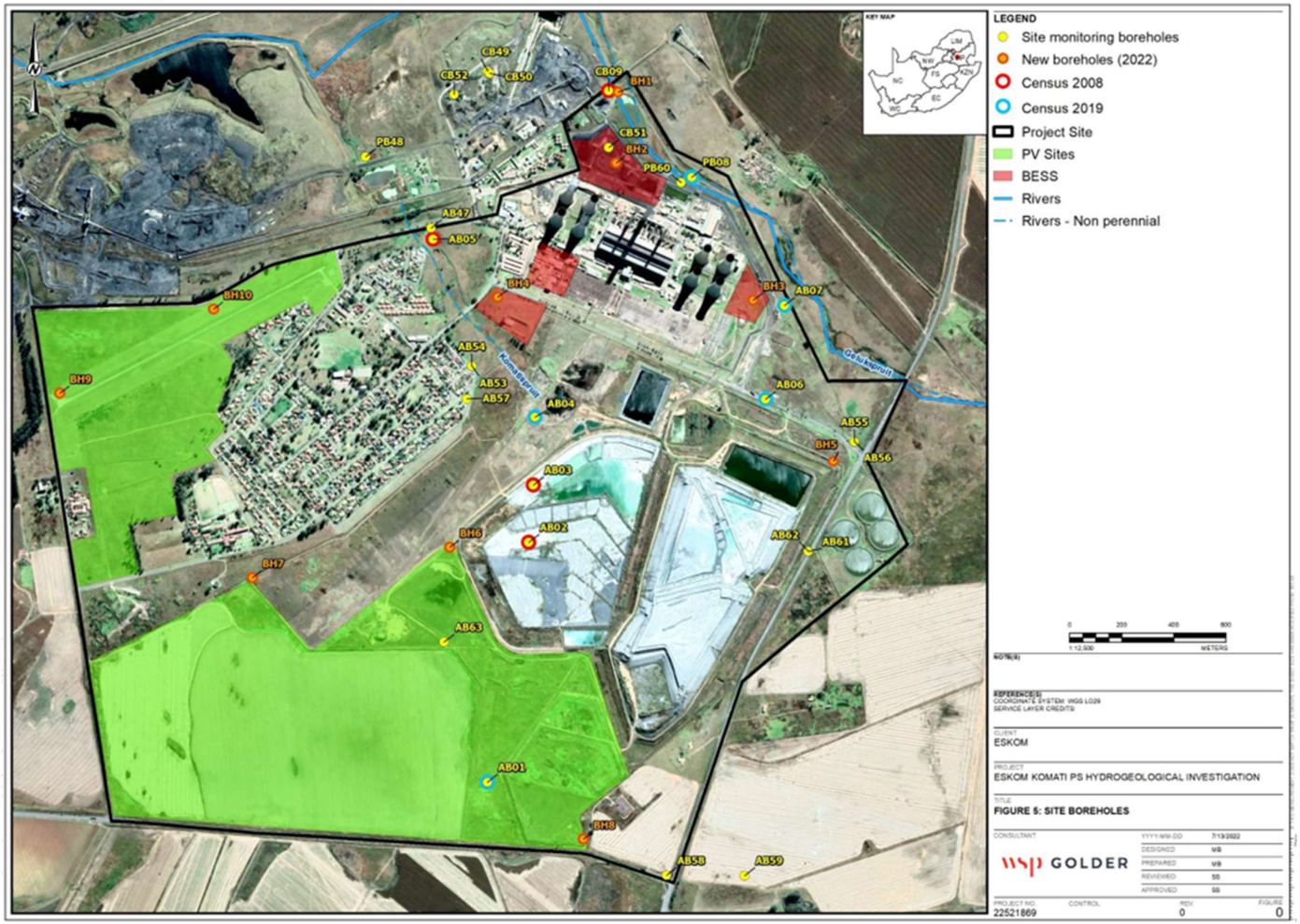


Figure 8-12: Hydrocensus

GROUNDWATER POTENTIAL CONTAMINANTS

Residual contamination may be present in the PV and BESS areas due to historical activities generally related to the Komati Power Station. A preliminary contaminant land investigation has been carried out to assess the potential contamination to groundwater specific to the Component B project area. The remainder of Komati portions as well as full Komati site context will be covered in the Component A contaminated land study initiated by Nemai Consulting as part of the full ESIA. Of note is the residual ash footprint noted to the east of Block A. Block E is located in the coal stock yard area. Van Niekerk, 2009 noted that this area comprises the coal storage yard and coal stockyard pollution control dam as well as the settling ponds. Additional potential sources within the Komati Power Station area include the domestic waste dump, sewage plant and the fuel depot.

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.

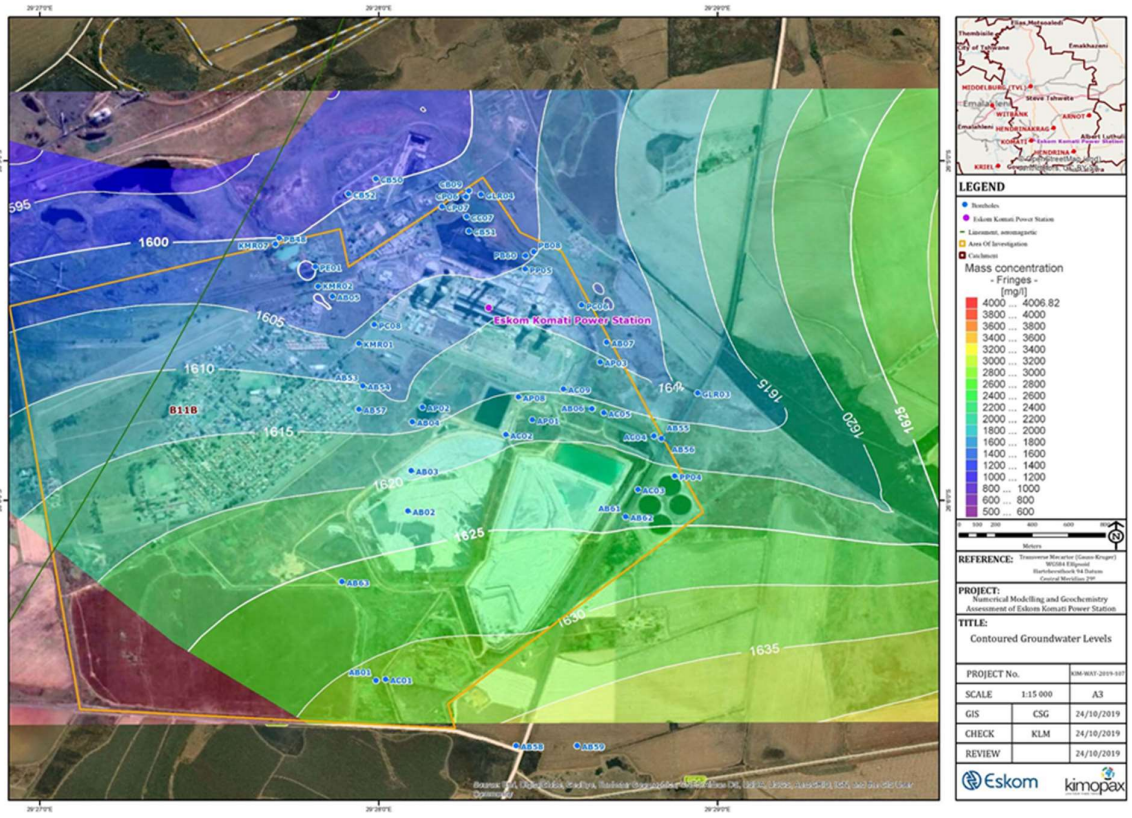


Figure 8-13: Groundwater contours (Halenyane, 2019)

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 8-12**). 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 8-12,** 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** Error! Reference source not found.).

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 8-4**). After rating the aquifer system management and the aquifer vulnerability, the points are multiplied to obtain a Groundwater Quality Management (GQM) index.

Table 8-4: 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 8-5: 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 8-6: 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** Error! Reference source not found.).

8.1.9 SOILS AND LAND CAPABILITY

*The following is extracted from the Soil and Agricultural Potential Assessment compiled by WSP and included as **Appendix** Error! Reference source not found..*

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 8-14**):

- **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 8-7 and broad land use options in the Table 8-8.

The study site incorporated two soil classes (**Figure 8-15**). 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 8-7: 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 8-8: 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 8-14: Soil Class

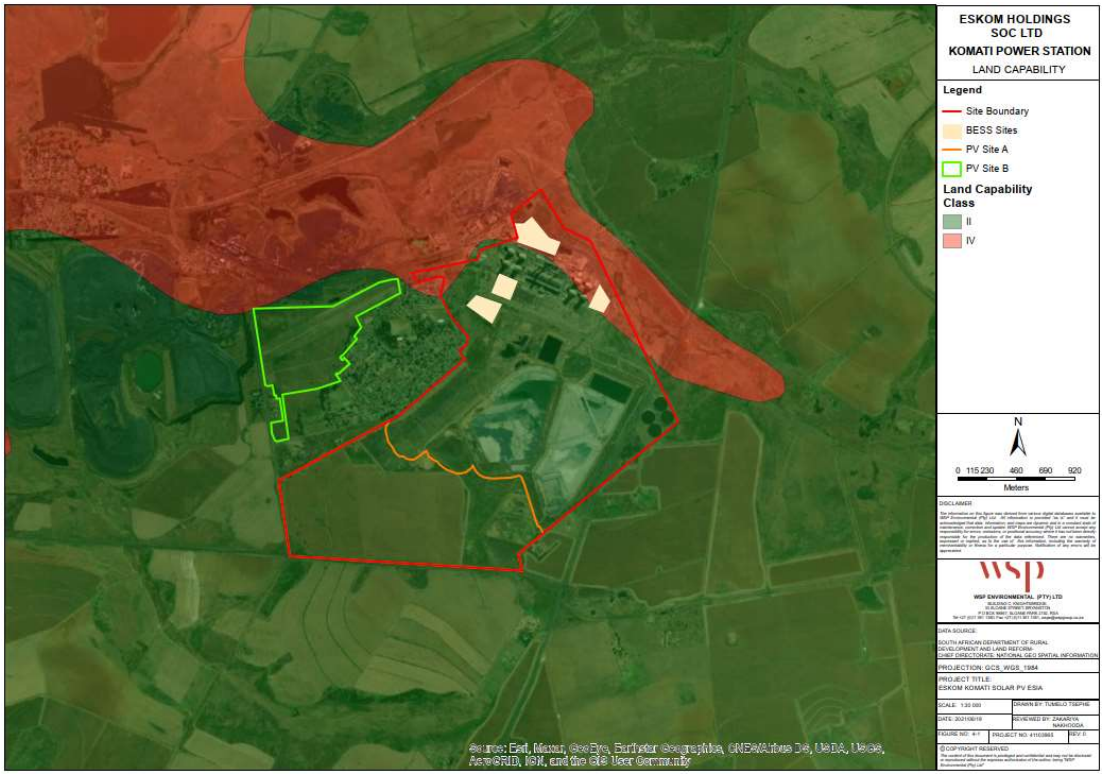


Figure 8-15: Land Capability (Schoeman *et al.*, 2000)

8.1.10 CONTAMINATED LAND

The following is extracted from the Contaminated Land Assessment compiled by WSP and has been included in ***Appendix*** *Error! Reference source not found.. The focus of the report and the corresponding environmental context is on the locations of the proposed solar PV, BESS and wind facilities. The remainder of Komati portions as well as full Komati site context will be covered in the Component A contaminated land study initiated by Nemai Consulting during the Final ESIA Phase and will give feedback on the potential migration of contaminants from the Komati power station to the surrounding community.*

A summary of the proposed development areas is given in **Table 8.9**.

Table 8.9: Proposed development areas

AREA	APPROXIMATE CENTRE POINT COORDINATES	SIZE (HA)	LOCALITY AND CURRENT USE
PV Site A	26° 6' 22.61" S 29° 27' 41.63" E	160.6	Southwest corner of the site with the R542 to the south, Komati town to the north, the Goedehoop Colliery (an underground coal mine) to the northwest, and the Eskom Komati Ashing Area to the east. Much of the area was historically a farm, (maize/corn rotated with bean crops). The historical ash and rehabilitated domestic waste footprints are in the eastern portion of the area.

AREA	APPROXIMATE CENTRE POINT COORDINATES	SIZE (HA)	LOCALITY AND CURRENT USE
			Mining of the underlying No. 4 coal seam is understood to be planned in this area. This seam is indicated as being some 20 to 100 m below surface (Anglo American, 2015).
PV Site B	26° 5' 45.17" S 29° 27' 15.52" E	60.9	Northwest corner of the site with Goedehoop Colliery to the west and north, and Komati town to the east. The Blinkpan police station is located on the south-western boundary. This area is not in use but undermining and a historical coal discard dump are noted to have been present in the northwest of this area. A landing strip / road crosses the area upslope of the historical Coal discard dump.
BESS A	26° 5' 27.74" S 29° 28' 8.22" E	2.6	Southwest portion of the KPS. Area is currently in use with several buildings and contractor's yards (D.B Thermal, Alstom Howden, Siemens, Clyde Bergeman, Roshcon EL and Roshcon Storage) as well as offices, parking areas and a boiler within the proposed development footprint. According to the site layout plan (Eskom) the distribution station is located to the east, with the KPS cooling towers and various buildings and parking areas to the north.
BESS B	26° 5' 33.34" S 29° 28' 2.59" E	3.2	The site is bounded by the Komati spruit (and wetland area) to the west and KPS (BESS A) to the northeast. Most of the area is not in use except for a church located in the south-eastern corner. There is no evidence of a graveyard, but this should be confirmed with Eskom. The church is located within a bunker which was historically an old shooting range.
BESS C	26° 5' 30.92" S 29° 28' 35.13" E	2	Site is bounded to the west by the KPS cooling towers and the drainage line of the Gelukspruit (and wetland) to the northeast. The Ashing Area is located to the south. Much of the area is currently not in use but there is a scrap yard in the southern portion. Eskom noted in discussion that an unknown fenced off area was leased to an unknown subcontractor. Based on the map provided

AREA	APPROXIMATE CENTRE POINT COORDINATES	SIZE (HA)	LOCALITY AND CURRENT USE
			by VPS, 2021 this may have been the temporary hazardous waste storage area.
BESS D	26° 5' 14.90" S 29° 28' 17.13" E	5.6	Site is the coal stockyard currently in use by KPS.

CONCEPTUAL SITE MODEL

A CSM has been developed based on the information contained within the preceding sections. The aim of the CSM is to define the source-pathway-receptor linkages which may be applicable under the assumption of an ongoing industrial land-use for the proposed development areas and recognising the existing surroundings and which, based on identification of linkages, could give rise to potential human and/or environmental risks.

The CSM has been developed sequentially on the basis that if no plausible linkages exist, then no significant risk is considered to be present. Therefore, the CSM specifically focusses on the linkages between the three aspects (i.e. exposure pathway) based on the specified scenarios and if any of these are not identified, then the risks are considered negligible. It should be acknowledged that the CSM would be expected to evolve as more information becomes available and it must be recognised that if the source-pathway-receptor linkages are altered, the CSM must be reviewed to ensure that the assumptions remain valid.

POSSIBLE SOURCES

While the Komati Power Station and the associated Ashing Area along with the neighbouring colliery represent more widespread sources from long-term operations, including secondary sources related to existing groundwater impacts, the potential pertinent primary sources specific to the targeted development areas are summarised as follows:

PV Site A

- Rehabilitated Domestic Waste Site;
- Historical Rehabilitated Ash Dump; and
- Unconfirmed use of fertilisers and/or pesticides for crop production.

PV Site B

- Historical Coal Discard Dump; and
- Ash and slurry used to backfill undermined areas.

BESS A

- Leakages from mechanical and electrical equipment, chemicals and fabrication activities;
- Spillages of chemicals from storage areas and the contractor's yard; and
- Washing and maintenance of equipment including potential solvents and paints.

BESS B

- Historical shooting range; and
- Unconfirmed graves associated with church.

BESS C

- Scrap yard; and
- Possibly hazardous materials within fenced temporary storage area.

BESS D

— Coal stockyard.

The Coal Discard Dump located on Site B is a historical dump with no information available regarding the establishment. A Geotechnical Study is planned for the Final ESIA Phase which will profile the Coal Discard Dump and provide further clarity on the contents of the dump.

KEY RECEPTORS

The following plausible receptors have been identified assuming the use of the site and surrounds remain consistent with the current land use:

Human Health

— Site workers – industrial use (current and future);
— Residents in neighbouring communities (i.e. Komati Town); and
— Groundwater Users: while there are no confirmed abstractions within the study area, groundwater use is known within 500 m of the Eskom boundary.

Environmental

— Groundwater: The aquifer beneath the site (> 35m) is classified as Minor/Poor with the overlying shallow weathered zone (<10m) being perched and discontinuous. The overlying shallow aquifer is not considered a viable groundwater resource but may contribute to seepage in the wetland areas as well as vertical migration into the regional deeper weathered/fractured rock aquifer. It is again noted that the underlying groundwater is known to have been impacted by mining and activities at Komati Power Station. Future mining of the No.4 coal seam underlying PV Site A is understood to be planned. The seam is located 20 to 100 m below ground surface (Anglo American, 2015); and
— Surface water: The closest surface water features are the wetlands associated with the Komatispruit and Gelukspruit drainage lines which originate within or immediately downstream of the Ashing Area. These flow towards the Koringspruit to the north of Komati Power Station.

Property

— Subsurface water supply pipelines and other infrastructure;
— Neighbouring third-party land; and
— Buried concrete/metal.

POTENTIAL PATHWAYS

Taking account of the possible sources, and notwithstanding the potential for ongoing or future direct release/s of contaminants, the hypothetical pathways by which these may affect the identified receptors, thereby potentially completing the exposure pathway/s are discussed within the following subsections.

Direct Exposure – Dermal Contact and Ingestion of Soils

Dermal contact and/or ingestion of contaminated soils are possible pathways, especially during the proposed development or other maintenance works, and particularly in areas not covered by hardstanding.

Vertical Migration of Contamination

Vertical migration of contamination may occur from source zones into the underlying groundwater by leaching and dissolution, or under the influence of gravity (i.e. liquid chemical products and oils). This will be exacerbated in areas where impervious cover is absent or of compromised integrity due to higher effective infiltration, where contaminant loading/s are more substantial, or where other conditions exist that may promote contaminant-specific mobility (i.e. introduction of acids).

While contributory impacts related to activities in the discrete development areas cannot be discounted, the known existing plume originating from the Ashing Area likely represents the principal source of groundwater contamination associated with activities at the Komati Power Station.

Lateral Migration within Groundwater

The lateral migration of contamination will be highly affected by the geological structure, the hydraulic gradient of the underlying groundwater, the permeability of the aquifer unit/s, the efficacy of any attenuation, the effects of recharge and the influence of seasonal fluctuations, as well as by local abstractions. Groundwater is expected

to flow generally towards the north towards the Koringspruit, and the plume associated with the impacts from the Ashing Area has been shown to already extend beyond the boundaries of Eskom's premises and, therefore, lateral migration is confirmed.

Future mining of the No. 4 coal seam underlying PV Site A could result in a change in the direction of groundwater flow during mining should groundwater from the regional aquifer be pumped from the workings. The mine workings will almost certainly be backfilled, but a cone of depression may remain until such time as the water levels recover post closure.

Direct Exposure – Dermal Contact and Ingestion of Groundwater

The likelihood of direct contact to site personnel and users is likely negligible under normal operating circumstances in the absence of abstractions within Eskom's boundaries. There is, however, evidence of groundwater uses within the vicinity of Komati Power Station, including for potable use and thus, this pathway represents a potential cause for concern.

Lateral Migration of Contamination via Stormwater

Surface water runoff from exposed and impacted soils, unconfined waste deposits, and/or impacted hardstanding may result in contaminant impacts to both man-made and natural stormwater channels and subsequent accumulation and/or migration therein. While appraisal of stormwater management is beyond the scope of the current document, it should be recognised that any impacts may migrate from the site and may also contribute to subsurface impacts.

Lateral Migration via Subsurface Infrastructure Conduits

It is plausible that subsurface utility trenches (i.e. sewers, effluent pipelines, water distribution network) may represent preferential flow-paths for the accumulation and migration of any contaminant impacts.

Inhalation of Vapours

Whilst unlikely to affect users of external areas, vapour intrusion into on-site buildings from either soils or shallow groundwater may represent a significant source of risk to human health.

Generation of Ground Gas

In addition to, but distinct from, the inhalation of vapours is the potential generation of ground gases within impacted unsaturated and saturated zones. The characteristics, mass and degradation of potential contamination may lead to the generation of methane, oxides of carbon, ethane, ethene and hydrogen sulphide, depending on the active processes. If migration of such gases into internal structure occurs, these may lead to asphyxiation (via oxygen displacement) or potential explosion.

Inhalation of Airborne Dust and Fibres

Agitation and disturbance of soils, especially during substantial earthworks and/or construction activities, may contribute to airborne particulate loads, including potential asbestos fibres, that could become inhaled either by site occupiers or by users of neighbouring areas, including residents of Komati. While specifically excluded from the current scope given its footprint outside of the development areas, the presence of the historical asbestos waste site should be acknowledged.

Direct Contact with Property

Contamination has the potential to permeate water supply pipelines used for human consumption or other processes and/or result in aggressive ground conditions which may compromise the structural integrity of buried concrete, as well as metal that may be in direct contact.

CURRENT INVESTIGATION

As well as to confirm health and safety arrangements, an initial site visit was conducted on 05 May 2022 to oversee and discuss the placement of intrusive positions within the relevant areas of concern.

Twenty-five soil sample localities and ten shallow borehole locations were identified following the initial site reconnaissance. As well as to define baseline conditions, these primarily focused on areas where substantial contamination may have been brought about by historic and/or current site activities across the proposed solar PV and BESS development portions; however, at the request of Eskom, also included exploratory positions proximal the fuel depot and down-gradient of the Ashing Area. Where possible, positions were sited down-gradient of the

activities/operations identified where any soil impact could be expected to be within the shallow soil profile. It should be noted that AH09 & AH10 were however situated to the east of BESS A due to access constraints and, therefore, may not be representative of potential impacts within the footprint of this proposed development area.

Subsurface clearance was undertaken by Hydrometrix Technologies (Pty) Ltd on 08 June 2022 under the supervision of WSP at each of the targeted intrusive locations. A Cable Avoidance Tool (CAT) was used to determine the presence/absence of underground power cables and metal utilities; thereafter, Ground Penetrating Radar (GPR) was adopted to confirm the absence (or otherwise) of other potential services.

Twenty-five auger holes (AH01–AH25) were manually advanced to depths ranging from 0.3–1.7 mbgl; geotechnical refusal was encountered in the majority of the holes. The positions of the auger holes, digitised using a handheld Global Positioning System (GPS), are illustrated on **Figure 8-16.**

At the request of Eskom, ten permanent monitoring wells (BH01–BH10) were advanced by Soil and Groundwater Remediation Services under supervision of WSP at targeted safely-accessible locations to depths of up to 10 mbgl. These were generally positioned in areas where coverage from the existing monitoring network was limited.

Boreholes were initially manually advanced to depths of up to 2 mbgl prior to completion by percussive techniques. Similar to the auger holes, headspace testing was completed at approximate 0.5 m intervals during manual advancement and, thereafter, at roughly 1 m intervals upon commencement of mechanical drilling; although, the inevitable loss of volatile due to the drilling methodology is recognised. The positions of the wells, determined via specialist surveyor subsequent to their installation, are illustrated on **Figure 8-16**. The borehole logs can be found in Appendix D of the Contaminated Land Assessment (**Appendix** Error! Reference source not found.).

Due to the short timeframes associated with the project, a maximum period of one week (depending on drilling progression) was allowed following installation for the newly installed wells to stabilise.

Measurements of static groundwater levels and the base of each position was first carried out using a dual phase interface meter that allowed the simultaneous measurement of the thickness of any potential Non-Aqueous Phase Liquid (NAPL). Thereafter, prior to sampling, accessible wells were purged of a maximum of three well volumes (where possible) using dedicated single-use bailers. Samples were then collected in laboratory prepared containers which were stored in a temperature-controlled environment for delivery to an accredited laboratory for subsequent analysis. All samples were taken according to internationally accepted protocols, ensuring the potential for cross contamination was minimised. A blind duplicate sample (BH10-01) was obtained from BH03 for quality control purposes. The monitoring data is summarised in **Table 8-10**.

Table 8-10: Groundwater Monitoring Data (06 June 2022)

LOCALITY	WELL	WATER LEVEL (M BGL)	WATER LEVEL (MAMSL)	OBSERVATION
Ashing Area (Up-gradient)	BH05	1.55	1,617.05	Light brown, no odour
PV Site A	BH07	1.52	1,629.28	Light brown, no odour
	BH08	1.25	1,649.55	Light brown, no odour
	BH06	1.3	1,624.1	Clear translucent, no odour
PV Site B	BH09	0.86	1,601.54	Clear translucent, no odour
	BH10	0.95	1,610.05	Clear translucent, no odour

LOCALITY	WELL	WATER LEVEL (M BGL)	WATER LEVEL (MAMSL)	OBSERVATION
	BH04	0.88	1,604.42	Clear translucent, no odour
BESS C	BH03	1.52	1,605.58	Light brown, no odour
BESS D	BH02	1.55	1,600.35	Brown, no odour
BESS D (Down-gradient)	BH01	1.97	1,596.73	Light brown, no odour

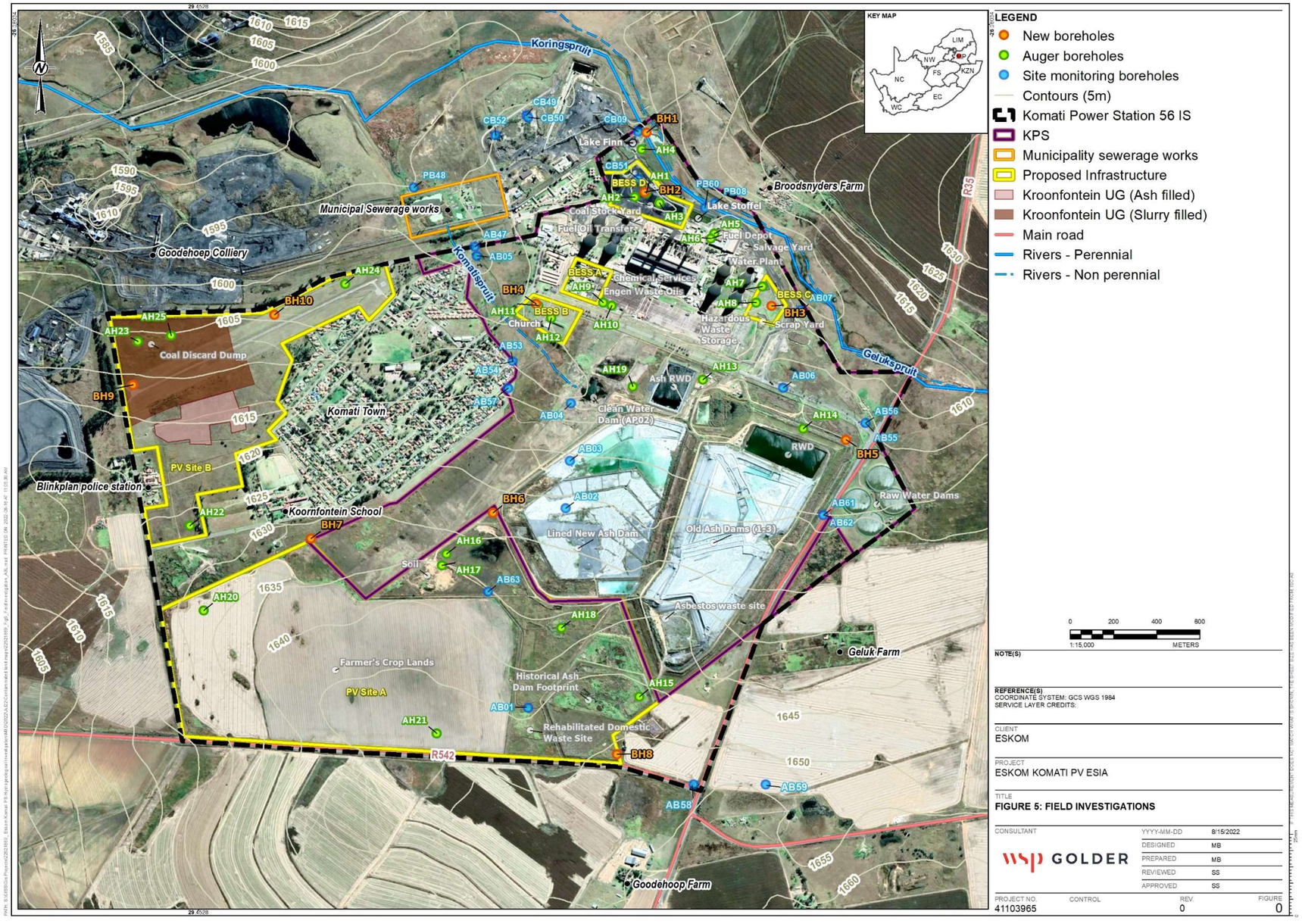


Figure 8-16: Sample localities

LABORATORY ANALYSIS

The soil and groundwater samples were submitted to Element Materials Technology (Element), a SANAS accredited laboratory (Facility No T0729) for analyses broadly consistent with the priority contaminants listed in the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN R.331 of 2014); however, supplemented with other selected determinants at the request of Eskom, as follows:

SOILS

- Metals/metalloids: antimony, arsenic, cadmium, chromium (total and hexavalent), cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium and zinc;
- Inorganics: ammoniacal nitrogen, chloride, cyanide, fluoride, nitrate, nitrite and sulphate;
- Aliphatic petroleum hydrocarbons (C_7–C_9, C_{10}–C_{14} and C_{15}–C_{36});
- Volatile Organic Compounds (VOC) including benzene, toluene, ethylbenzene and xylenes (BTEX);
- Semi-Volatile Organic Compounds (SVOC) including Polycyclic Aromatic Hydrocarbons (PAH);
- Polychlorinated Biphenyls (PCB); and
- Physiochemical: pH and electrical conductivity.

NB: *asbestos has been specifically excluded from the current assessment given the outcomes of VPC, 2021 as summarised in Table 1 in relation to the historical asbestos disposal site.*

GROUNDWATER

- Metals/metalloids: antimony, arsenic, cadmium, calcium, chromium (total and hexavalent), cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silicon, sodium, vanadium and zinc;
- Inorganics: ammoniacal nitrogen, chloride, fluoride, nitrate, ortho-phosphate and sulphate;
- Aliphatic petroleum hydrocarbons (C_7–C_9, C_{10}–C_{14} and C_{15}–C_{36});
- VOC including BTEX and Tentatively Identified Compounds (TIC);
- SVOC including PAH and TIC;
- PCB; and
- Physiochemical: alkalinity (total), electrical conductivity, pH, Total Dissolved solids (TDS) and Total Organic Carbon (TOC).

GROUND AND GROUNDWATER CONDITIONS

SOILS

The deepest soil profile that could be achieved was at PV Site A within the area previously used for crops. The soil profile comprised darker brown clayey sand which become lighter brown with depth. No crops were evident at the time of the investigation.

The “natural” soil horizon (weathered bedrock) comprises a moist, orange, brown to red-brown sandy clay or clayey sand (residual Vryheid formation) with occasional mottled clayey sand with ferricrete nodules in most of the areas inferring a seasonally fluctuating water table.

Fill/made ground was encountered in several samples including:

- Coal was observed to 1.5 mbgl (BH02) in the coal stockyard; auger holes (AH01–AH03) refused at 1 mbgl and only coal samples could be obtained;
- Ash was observed downgrade of the Ashing Area at AH14 and in BH05 and BH06. While ash was not identified in AH13, the soil was darker in colour than elsewhere on the site implying that this area is affected by runoff from the ash dams. By contrast, there was no ash indicated in the rehabilitated ash dump footprint sample (AH15) within PV Site A;
- A shallow horizon of around 0.5m was noted for the exploratory holes (AH23, AH24, AH25, BH9 and BH10) located in the area of the rehabilitated dump in the vicinity of PV Site B. A seepage zone was noted as perched on mottled sandy clay under this layer in the auger holes (AH23, AH24 and AH25). There was no evidence of ash in the vicinity of this rehabilitated dump, but the gravel horizon could be backfilled weathered material sourced from the surrounding area; and

— A soil stockpile of unknown origin (possibly from road building or topsoil) was observed in PV Site A. Samples were obtained near the soils (AH16 and AH17).

GROUNDWATER

Seepage was encountered in the boreholes with BH7 and BH8 (located in PV Site A), but the remaining boreholes were moist with no discrete groundwater strikes observed during drilling. Groundwater depths following stabilisation were recorded in all the boreholes with depths varying from 0.86 to 1.97 mbgl which is broadly consistent with the existing dataset (Komati WISH database).

Comparing topographic and groundwater elevations an R^2 value of 0.99 is calculable resulting in a very strong correlation coefficient and consistent with previous works. The overall flow direction to the north.

It should be stressed that hydrogeological conditions are unlikely to be homogenous especially recognising that the shallow aquifer is discontinuous and, therefore, local variability should be expected that may differ markedly from this calculated average.

CONTAMINATION OBSERVATIONS

The results of headspace testing indicated that volatile vapours were below the PID's level of detection (<0.1 ppm) within all soil samples. Nonetheless, visual evidence of soil contamination was noted as follows:

— Coal was noted to a depth of 1.5 mbgl in the coal stockyard;
— Ash was noted within the proximity of the Ashing Area;
— Discolouration (staining) was observed on the brick paving at the fuel depot (AH05 and AH06); and
— Denudation was seen in the vicinity of BESS Area A adjacent to the contractor's yard.

Groundwater samples varied from brown to clear with no obvious visual or olfactory evidence of contamination.

SOIL RESULTS

The South African Framework for the Management of Contaminated Land (Framework, May 2010) developed by the then Department of Environmental Affairs (DEA)[4] in line with Part 8 of the NEM: WA, outlines the methodology for the screening of potentially contaminated sites to provide a risk-based decision support protocol for their assessment. Further, the then DEA gazetted GN R.331 in May 2014, with these being promulgated under Section 7(2)(d) of the NEM: WA by the then Minister of Water and Environmental Affairs. GN R.331 provides Soil Screening Values (SSVs), a tiered system of priority soil contaminants, to facilitate the determination of sensitivity of the relevant receptor which may be subject to exposure. These are defined as follows:

— SSV1 represents the lowest value calculated for each parameter from both the human health and water resource protection pathways. SSV1 values are not land-use specific; and
— SSV2 represents the land-use specific soil concentration and are appropriate for screening level site assessment in cases where protection of water resources is not an applicable pathway for consideration.

Separately, GN R.331 provides Soil Screening Levels (SSLs) for a number of anions; however, it is notable that these are not related to potential risks to human health via direct exposure. These are specifically investigation values that are relevant only to provide guidance on potentially excessive levels of salts, which can represent a major cause of deterioration of soil or water quality from an ecological perspective.

INITIAL SCREENING

Recognising the general approach prescribed by the Framework, the analytical results for the analysed contaminants of concern have first been compared to the SSV1s published in GN R.331. Where SSV1s are not available reference has been made to the United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for Residential Soil (May 2022) as a reasonable alternative while recognising the different paradigm behind their derivation. Whilst conservative under many potential exposure scenarios, such screening allows justified rationalisation of potential contaminants that may require further assessment and/or management, and discounts those potential exposure pathways that do not pose a significant risk.

[4] In June 2019, the DEA was renamed the Department of Environment, Forestry and Fisheries (DEFF) and, in April 2021, was renamed the DFFE

Cadmium, hexavalent chromium, cyanide and PCBs as well as the majority of the VOCs and SVOCs were recorded below their respective laboratory detection limits and, therefore, are not seen as contaminants of concern for further consideration. Otherwise, the following is noted:

- Arsenic, lead, and manganese were above their respective SSV1s within shallow soils across most of the proposed development areas with the exception of BESS A and BESS B. Similar is noted for vanadium although this was also below its SSV1 at BESS D and the fuel depot, as well as down-gradient;
- Excluding samples from BH02, BH06 and AH10 copper was ubiquitously above its SSV1;
- Iron was above its USEPA RSL within various samples, and largely within ferruginised soils;
- Sulphate was above its SSL within those samples retrieved from AH01 (coal stockyard) and AH15 (historical ash dump at PV Site A); and
- Pyrene and benzo(a)pyrene were above their respective SSV1s within the sample collected from AH06 at the fuel depot.

The pH of the samples collected ranged widely from 4.58–7.92. Although there are no SSVs published for the protection of human health under the NEM: WA, the South African National Standard (SANS) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), SANS 10234:2019 recognises materials with a pH within a range of 2–11.5 as not being hazardous

FURTHER SCREENING

Where contaminants have been recorded in excess of their respective initial assessment criteria and following the stepwise methodology described in the framework, further screening has been separately carried out to ascertain whether these could plausibly represent risks to either human health or aquatic systems based on site-specific considerations.

As indicated, the SSLs for anions (i.e. sulphate) are only relevant to provide guidance on potentially excessive levels of salts and, therefore, have not been carried forwards into the further screening exercise. Nonetheless, with the exception of localised instances of elevated sulphate within samples containing coal and ash these were consistently below their respective SSLs and so no concern is raised.

RISK TO HUMAN HEALTH

Potential risks to human health are based on land-use specific considerations and refer to the applicable SSV2s for the following land uses:

- Informal residential;
- Formal residential; and
- Commercial/industrial.

Recognising that the town of Komati lies central to the overall proposed development areas, SSV2s relevant for formal residential use have been conservatively adopted to ascertain whether soil contamination may represent a potential health risk. The following is noted:

- With the exception of manganese AH20 (PV Site A), BH10 (PV Site B) and BH04 (BESS B) as well as vanadium at AH21 (PV Site A), metals were below their respective SSV2s. While these localised anomalies are noted, overall average concentrations of both manganese (~754 mg/kg) and vanadium (~124 mg/kg) were below their SSV2s for a formal residential setting. Therefore, in the wider context these are considered unlikely to represent a significant source of risk with respect to human health, especially when recognising that all were below their SSV2s relevant for the commercial/industrial land-use of the proposed development areas; and
- Benzo(a)pyrene was above both its formal residential and commercial/industrial SSV2s within AH06 at the fuel depot. This falls outside of the proposed development areas covered under this report; however, is indicative of potential risks to human health from ongoing operations and possibly symptomatic of more extensive impacts local to the fuel depot that will require consideration by Eskom during decommissioning.

RISK TO AQUATIC SYSTEMS

With respect to soil-based contamination, potential risks to aquatic systems are defined based on the sensitivity of the surface water and groundwater resources. The framework methodology recognises the adoption of SSV1 as generic criteria in the event that there is a current or potential future groundwater use on or within 1 km of a site, or there is a permanent surface watercourse on or adjacent the site. Recognising the proximal surface

watercourses, including wetlands, as well as the abstractions within 500 m of the premises boundary, these criteria are considered to be satisfied and therefore, with the exception of iron (USEPA RSL for human health only).

It must, however, be acknowledged that the published SSV1s do not distinguish between the protection of drinking water and freshwater aquatic ecosystems, nor do they differentiate from where direct human health risks may represent the critical exposure pathway. In this regard, the following is noted in respect of the published SSV1s:

- Arsenic and lead are based on the protection of drinking water. While lead was noted in the shallow groundwater samples, arsenic was consistently below its laboratory detection limit;
- Manganese, vanadium and benzo(a)pyrene are based on the direct human health risk under an informal residential land-use (as noted by their SSV1s being equivalent to their corresponding SSV2s); and
- Copper and pyrene are based on the protection of the freshwater aquatic environment.

Based on the outcomes of the targeted investigatory works, a number of contaminants largely consisting of metals and nutrients/salts together with localised PAHs have been identified within both soils and/or shallow groundwater that are indicative of impacts related to activities at KPS, and particularly associated with the Ashing Area that lies outside of the proposed development areas that are the focus of this document. These will be covered in the Component A contaminated land study report during the final ESIA. A summary of the findings from the study is indicated in **Table 8-11**.

Table 8-11: Summary of findings in soil and groundwater for each area

AREA OF INVESTIGATION	SUMMARY OF CONCENTRATIONS EXCEEDING SCREENING VALUES	RISK SUMMARY
PV Site A	**Soil:** Cu (in almost all samples) and As, Pb, Mn, and V were locally elevated above the SSV1 in some samples but less than SSV2 screening levels. Sulphate was elevated above SSV in AH15. **Groundwater:** Pb (all), Mn (BH6 only), SO4 (BH8 and BH6) elevated above SANS 241:2015. Pb (all), Mn (BH6 only), Zn (all), ammoniacal N (all) elevated above SAWQG for aquatic species (SAWQG).	Potential sources: Area was historically used for crops with historical footprints in the eastern portion. Receptors to which an exposure pathway are complete include site workers (human health) and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. There is an existing groundwater plume from the adjacent Ashing area and seeps to the adjacent wetland are impacted by surface runoff from this area. No 4-coal seam is anticipated to be mined some 20 – 100m below the surface. The risk to these workings from the existing plume is outside this scope of work.

AREA OF INVESTIGATION	SUMMARY OF CONCENTRATIONS EXCEEDING SCREENING VALUES	RISK SUMMARY
PV Site B	**Soil:** Cu (in all samples) and As, Pb, Mn, and V were locally elevated above the SSV1 in some samples but less than SSV2 screening levels. **Groundwater:** Pb (BH9 only), Mn (BH6 only), SO4 (BH8 and BH6) elevated above SANS 241:2015 and SAWQG. Zn (both) > SAWQG	Potential sources: A coal discard dump footprint is located to the north-west. Backfilled mine workings have been noted to occur at a depth greater than the 10m assessed by this study. Receptors to which an exposure pathway may be complete include site workers (human health), residents of Komati town, and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern but there will, be a requirement to ensure appropriate management of excavations, and especially where these are required within areas proximal to residential dwellings of Komati.
BESS A	**Soil:** Cu in AH9 elevated above the SSV1 but less than SSV2 screening levels. Concentrations were all below SSV1 in the second sample AH10. **Groundwater:** No samples	Area is currently in use with several buildings and contractor's yards. Samples were therefore obtained from the adjacent area. Receptors to which an exposure pathway may be complete include site workers (human health) and the environment. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. The risk from soils is as indicated above for the general site but visual inspection of this area may be necessary following demolition/ decommissioning to ensure there is no local areas of concern.

AREA OF INVESTIGATION	SUMMARY OF CONCENTRATIONS EXCEEDING SCREENING VALUES	RISK SUMMARY
BESS B	**Soil:** Cu (in all samples), Pb and Mn locally in BH4 elevated above the SSV1 in some samples but less than SSV2 screening levels **Groundwater**: Fe, Mn > SANS 241-2015 aesthetic Mn, Zn > SAWQG	Potential sources: Most of the area is not in use except for a church located in the south-eastern corner. There is no evidence of a graveyard, but this should be confirmed with Eskom. The church is located within a bunker which was historically an old shooting range and there could be spent bullets within the bunker. Receptors to which an exposure pathway may be complete include site workers (human health). Komati town and the environment, specifically the aquatic environment of the Komati stream. Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. The risk to the water resources (aquatic and groundwater) are influenced by the surface runoff and groundwater migration from the Ashing Area.
BESS C	**Soil:** Cu (in all samples), As, Pb, Mn and V locally elevated above the SSV1 in some samples but less than SSV2 screening levels. **Groundwater:** EC, Mn, SO4 > SANS241-2015. PO4, Ammoniacal N, Mn, Zn, Pb > SAWQG	Potential sources: KPS, Ashing Area (upgradient), scrap yard and a possible temporary hazardous waste facility. Receptors to which an exposure pathway may be complete include site workers (human health) and the environment, specifically the aquatic environment of the Gelukspruit (and wetland). Soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. Ground water quality is affected by contamination migrating from the Ashing Area.

AREA OF INVESTIGATION	SUMMARY OF CONCENTRATIONS EXCEEDING SCREENING VALUES	RISK SUMMARY
BESS D	All surface samples were taken from coal fill. As, Cu, Pb, Zn locally elevated above the SSV1 in some samples but less than SSV2 screening levels. Sulphate elevated above SSV locally in AH1. Soil results downgrade of the coal stockyard and KPS area: Cu (both samples), As, Mn and Pb (AH4 only) **Groundwater:** Fe (BH2 only and not downgrade), Mn and ammonical N (both and higher on boundary of KPS site in BH1), Eskom monitoring sites also show elevated Mn in boreholes in coal stockyard and on boundary. SO4 higher than SANS241-2015 and WSP borehole results. Pb, Mn, Zn > SAWQG	Potential sources: Site is the coal stockyard currently in use by KPS. Receptors to which an exposure pathway may be complete include site workers (human health), groundwater users (combined impact from KPS area and not solely the coal stockyard) and surface runoff to the streams. Soils were not assessed due to the thickness of the coal layer. Based on the information available, soils are largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. The groundwater is affected by both the upgradient groundwater plume and the coal stock yard itself. There is a limited risk to groundwater users, but it is understood that the groundwater plume is the focus of a pending comprehensive groundwater model,

Contaminated groundwater from the Ash Dam Facilities has been shown to extend to the north towards the Koringspruit. WSP understands that this is currently under investigation with an updated groundwater model in progress. The potential impact from future undermining of the PV Site A should be considered as part of this study and this may influence the planned remediation of the groundwater plume.

8.2 BIOLOGICAL ENVIRONMENT

8.2.1 TERRESTRIAL BIODIVERSITY

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix E-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 8-17**):

- 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 8-17**) 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.

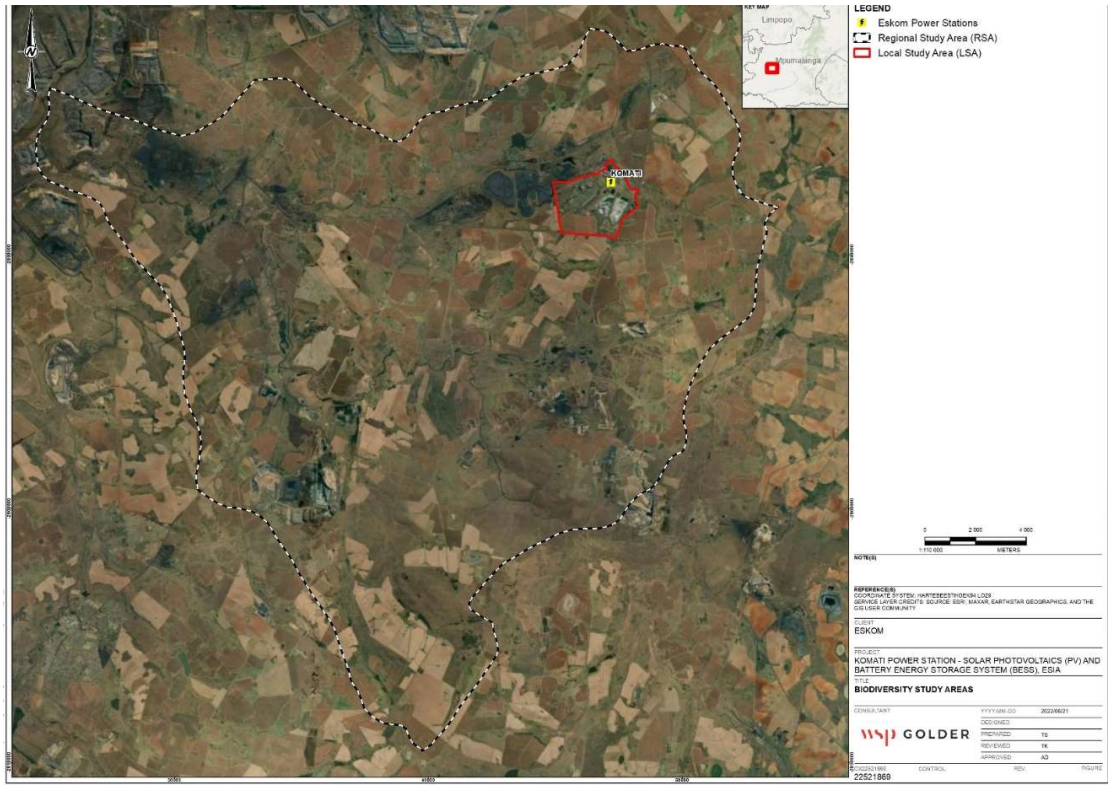


Figure 8-17: Local and regional study areas

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 8-18**).

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*).

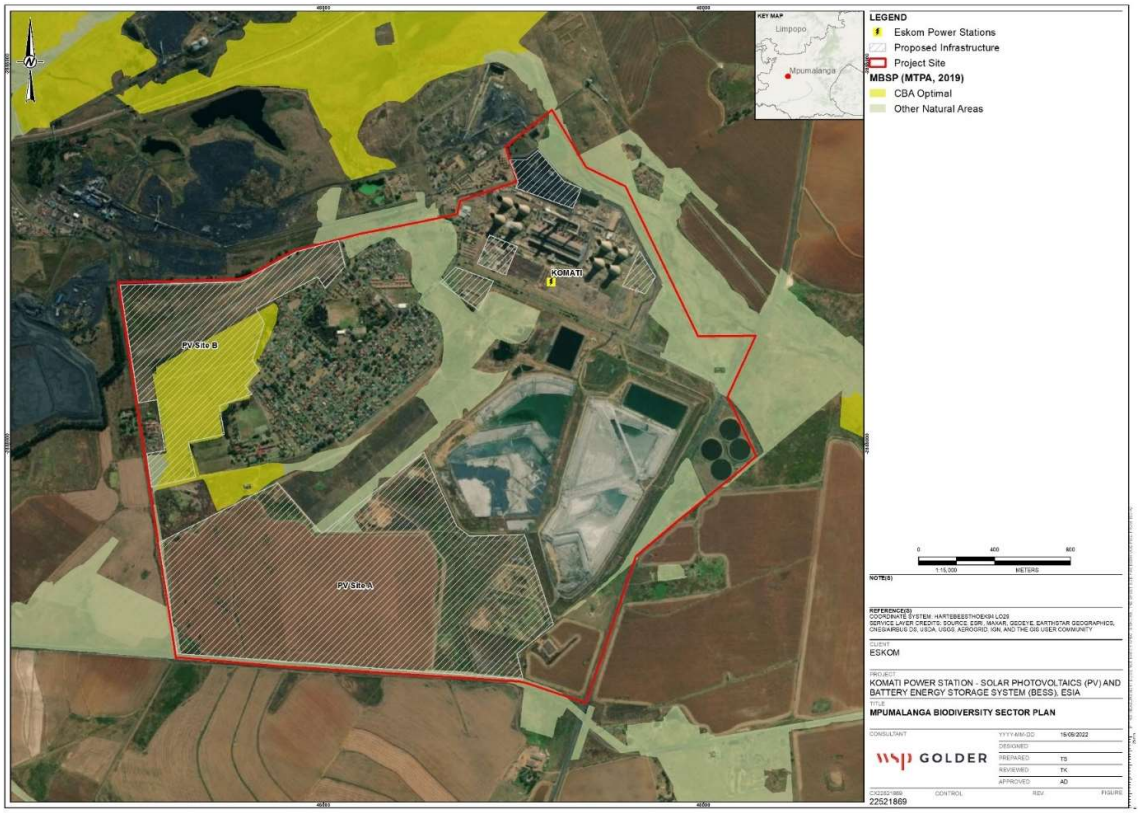


Figure 8-18: Mpumalanga Biodiversity Sector Plan in relation to the proposed development

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 8-18**).

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 8-19**).

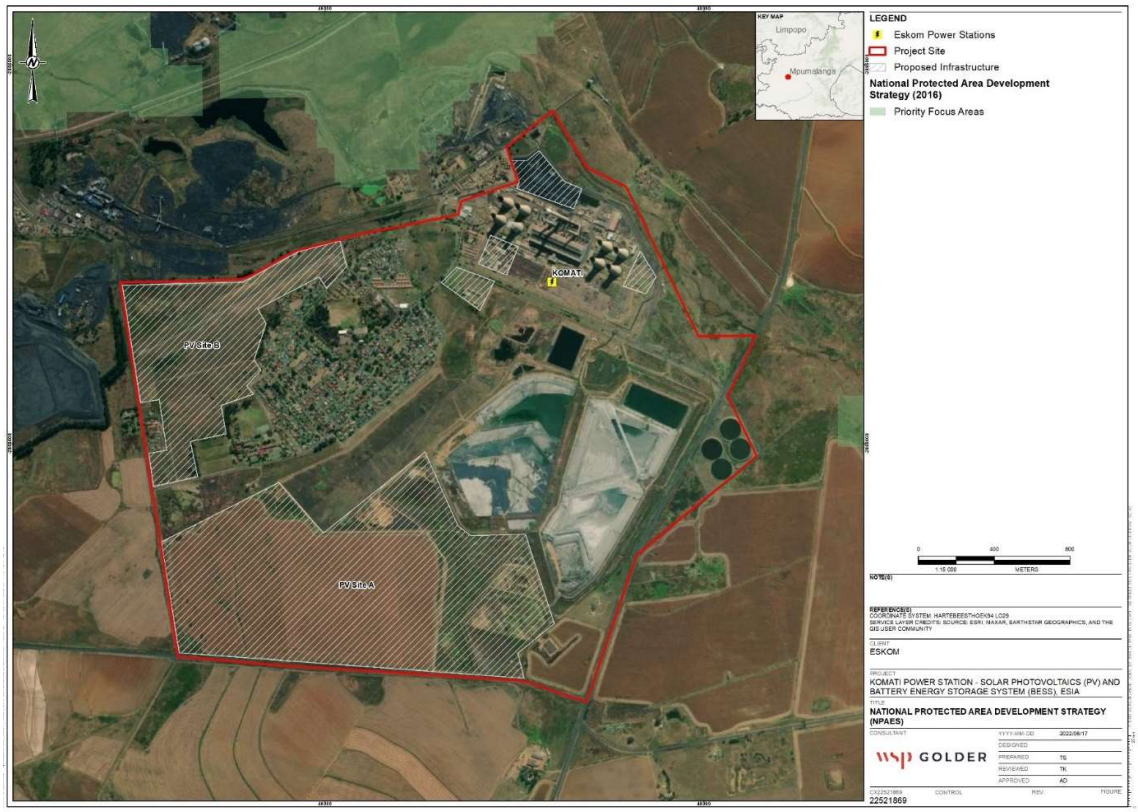


Figure 8-19: Priority Areas for Protected Area Expansion in relation to the proposed development

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 8-20**) 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.

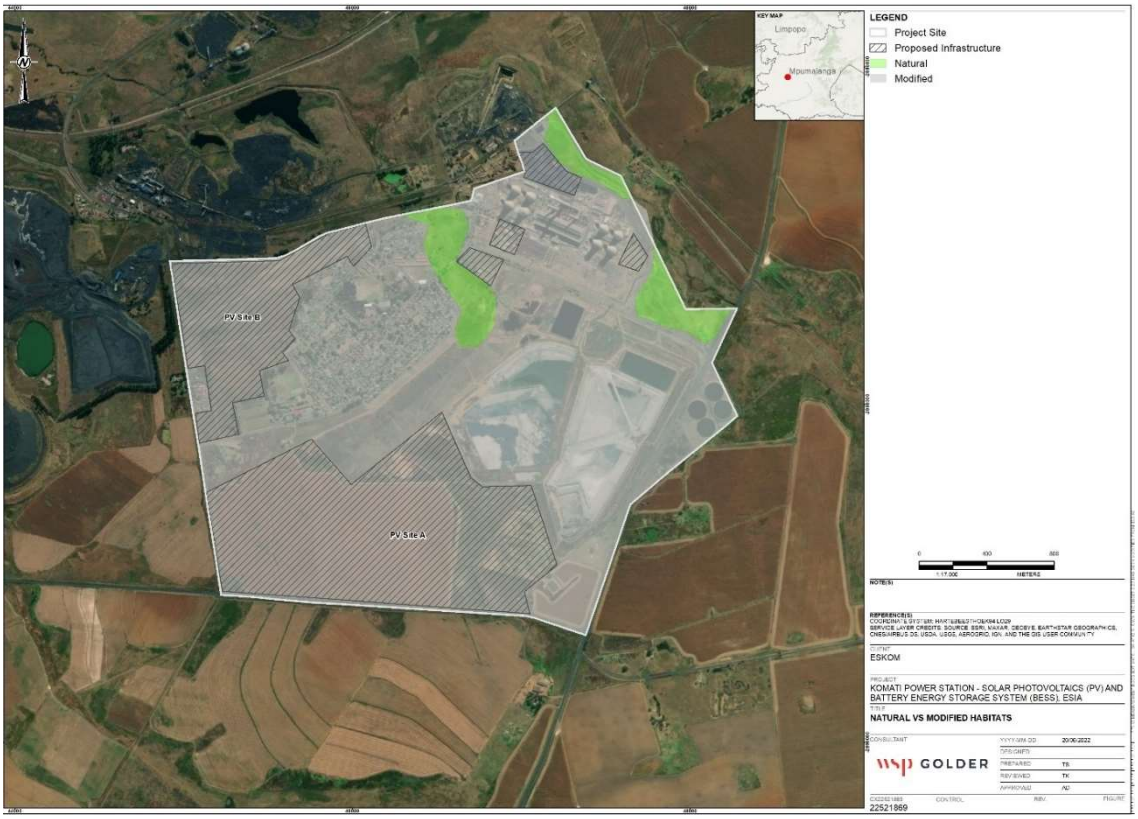


Figure 8-20: Natural, modified and critical habitat

8.2.2 TERRESTRIAL VEGETATION

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix*** *Error! Reference source not found.*

VEGETATION TYPES

The site is situated within a single vegetation type, Eastern Highveld Grassland (Gm12) (**Figure 8-21**), 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.

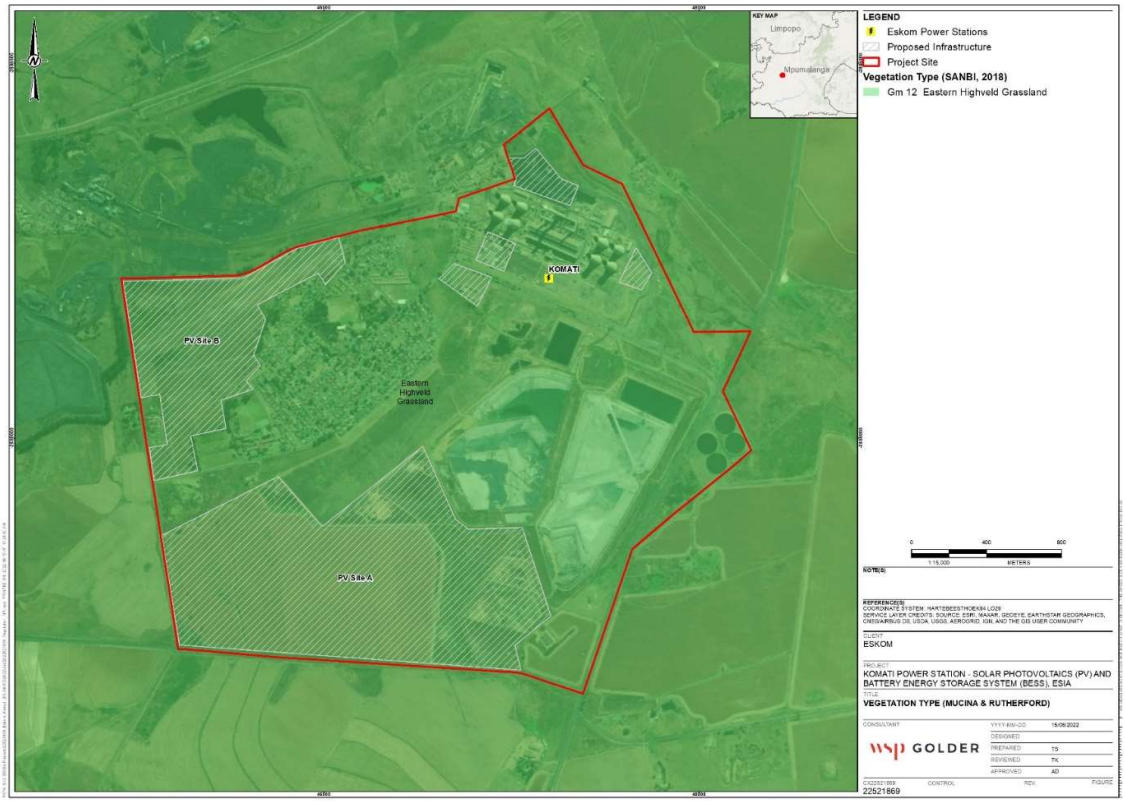


Figure 8-21: Proposed development in relation to Mucina & Rutherford vegetation types

NEMBA THREATENED ECOSYSTEMS

Eastern Highveld Grassland is considered to be Vulnerable nationally (**Figure 8-22**) (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.

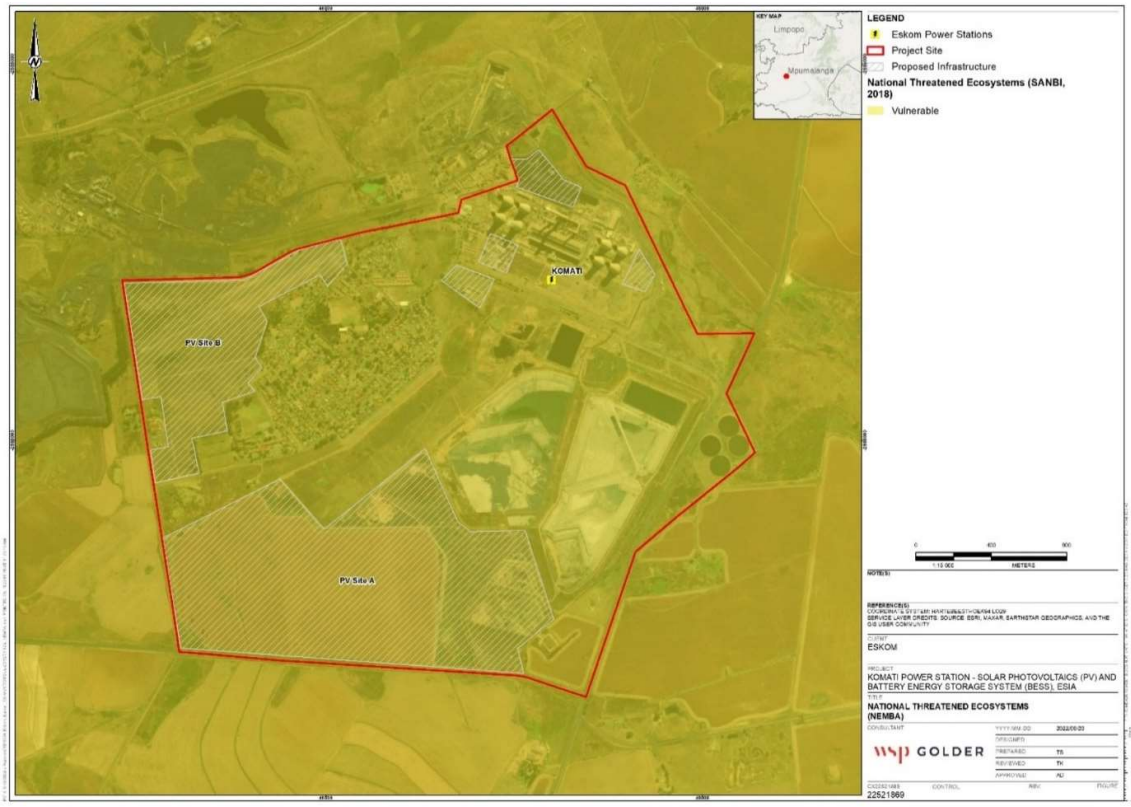


Figure 8-22: Proposed development in relation to the National Threatened Ecosystems (SANBI, 2018)

FLORA SPECIES OF CONSERVATION CONCERN

A list of flora SCC which occur within the region are provided in **Table 8-12**. 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 8-12**) 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 8-12: 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	–	–

8.2.3 FAUNA

The following is extracted from the Terrestrial Biodiversity Assessment compiled by WSP and included as ***Appendix*** *Error! Reference source not found.*

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 8-13**).

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 8-13**) 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 8-13: 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 8-14**). 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 8-14**) appeared on the IUCN Red List of Threatened Species. Only one has been classified as Vulnerable (Secretary bird).

Table 8-14: 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 8-23**), 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.

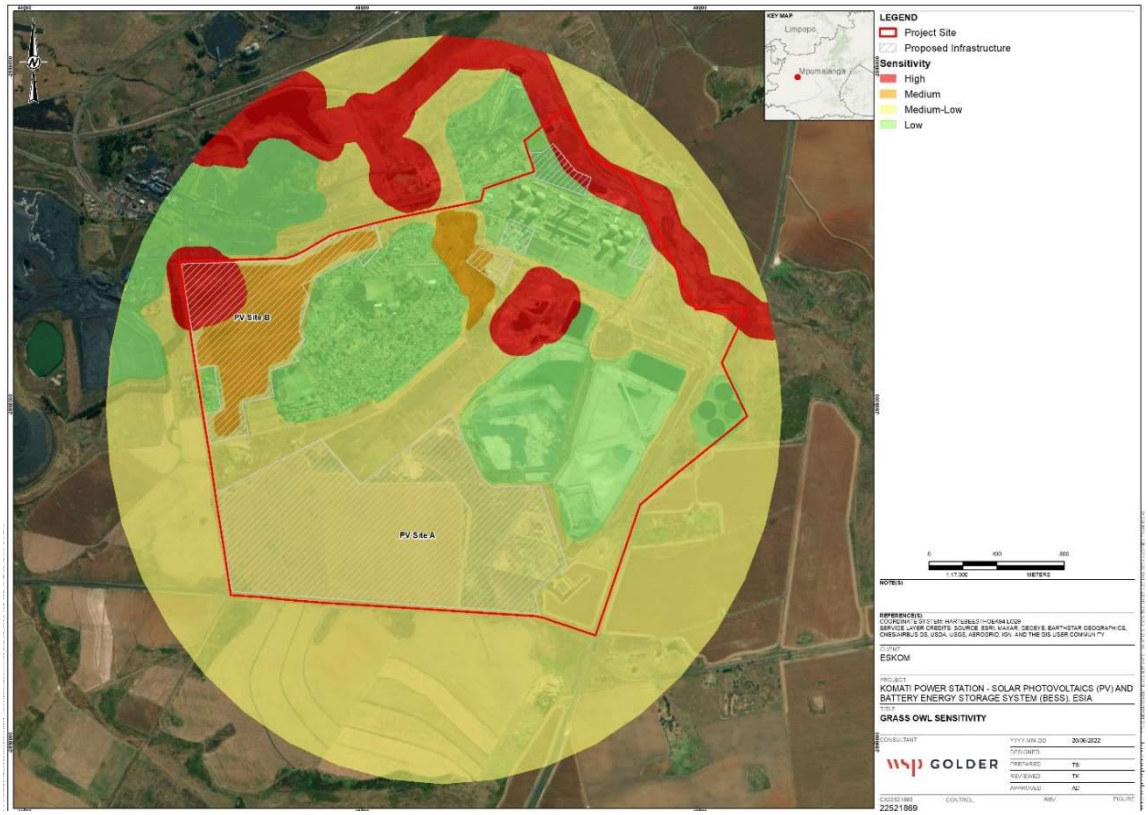


Figure 8-23: Grass owl sensitivity map

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 8-15**). None of the frog species are considered SC. Ten reptile species were recorded from both 2629BA and 2629AB QDSs (**Table 8-16**). 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 8-15**) and reptile species (**Table 8-16**) 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 8-15: 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 8-16: 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

8.2.4 AQUATIC BIODIVERSITY

The following is extracted from the Aquatic Biodiversity compiled by WSP and included as ***Appendix*** *Error! Reference source not found..*

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 8-24**);
- 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 8-25**).

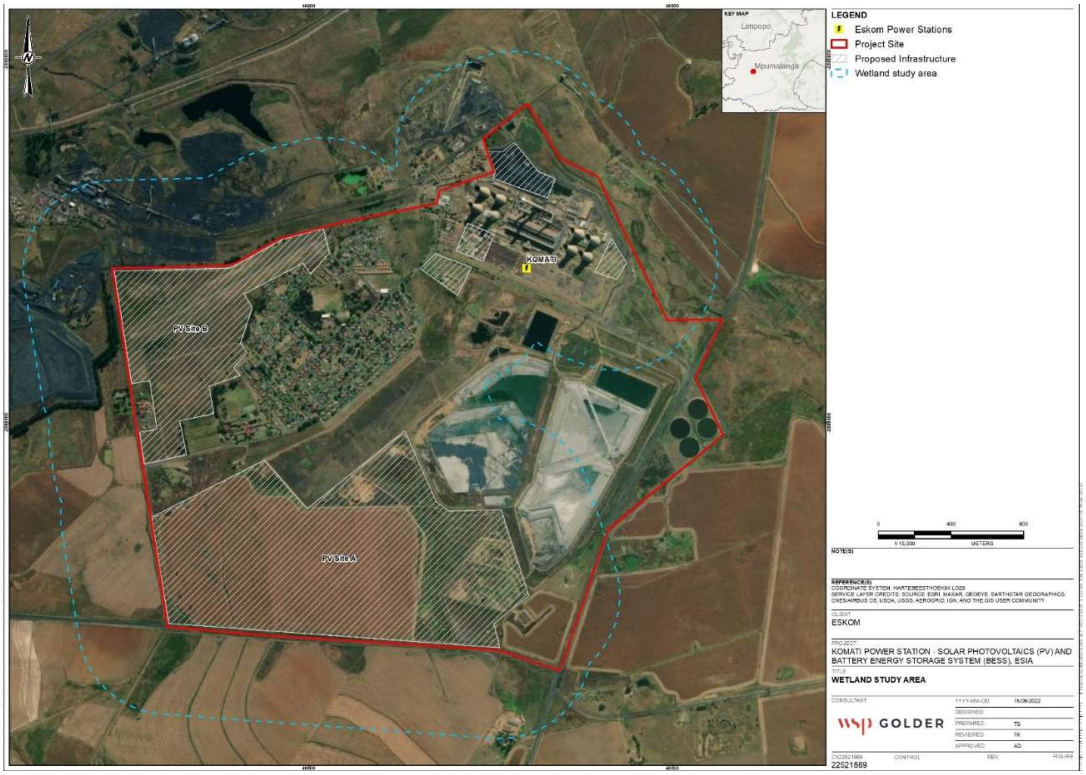


Figure 8-24: Aquatic biodiversity local study area

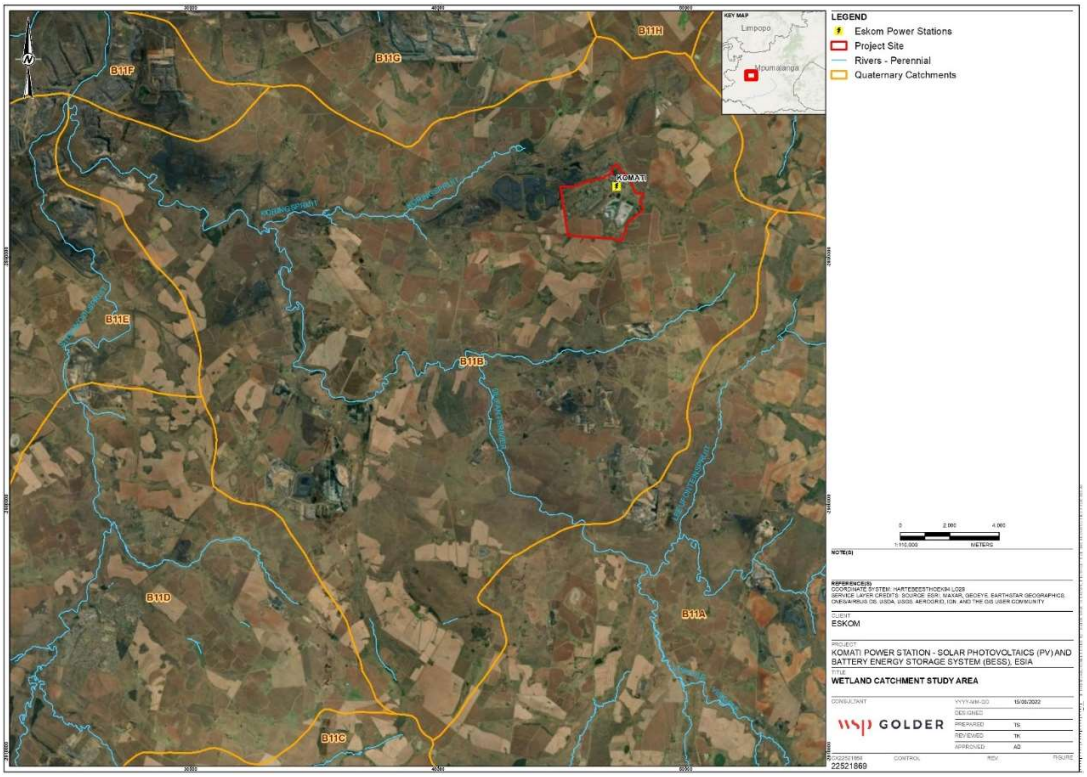


Figure 8-25: Aquatic biodiversity regional study area as defined by the quaternary catchment B11B

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 8-26**). Since the watercourses in the study area are wetland systems, no assessment of macroinvertebrates or fish is included in the baseline description.

Figure 8-26: 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 8-27**), 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.

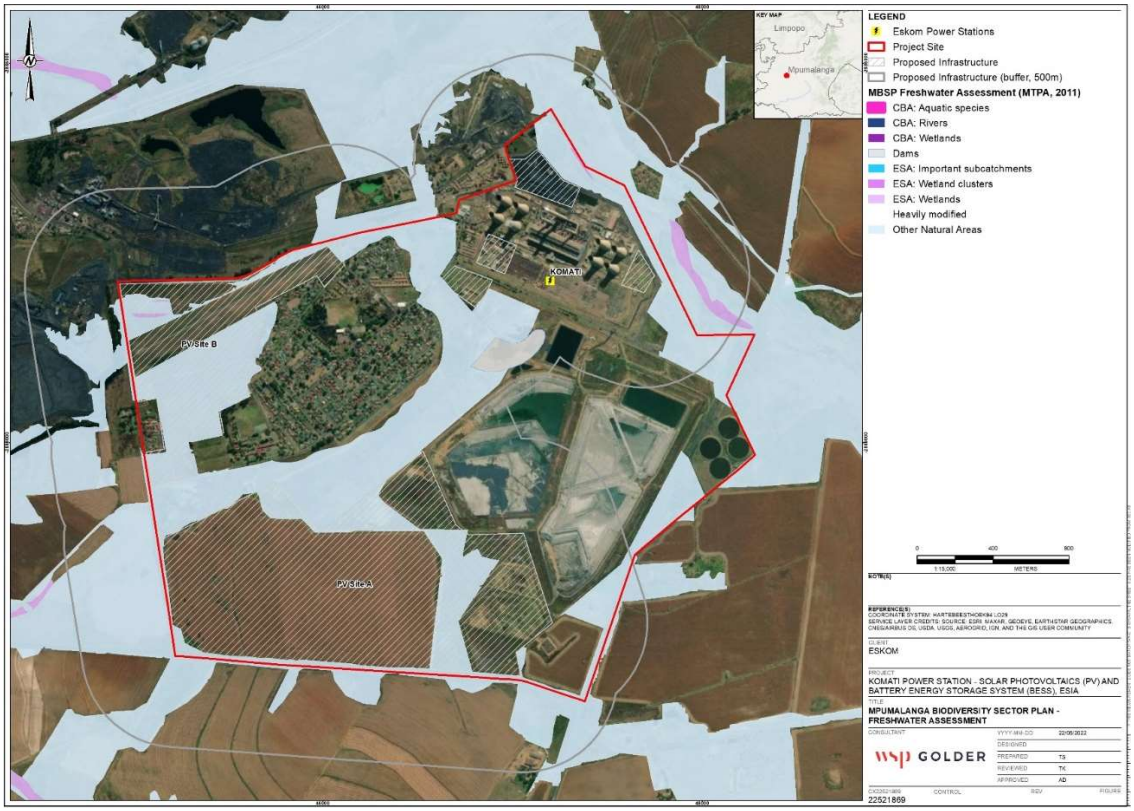


Figure 8-27: MBSP Freshwater Assessment (MTPA, 2011)

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 8-28** and **Figure 8-29** 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 8-30**); these systems were prioritised for confirmation of delineation, and assessment of wetland health and ecological importance, during the wetland field survey.

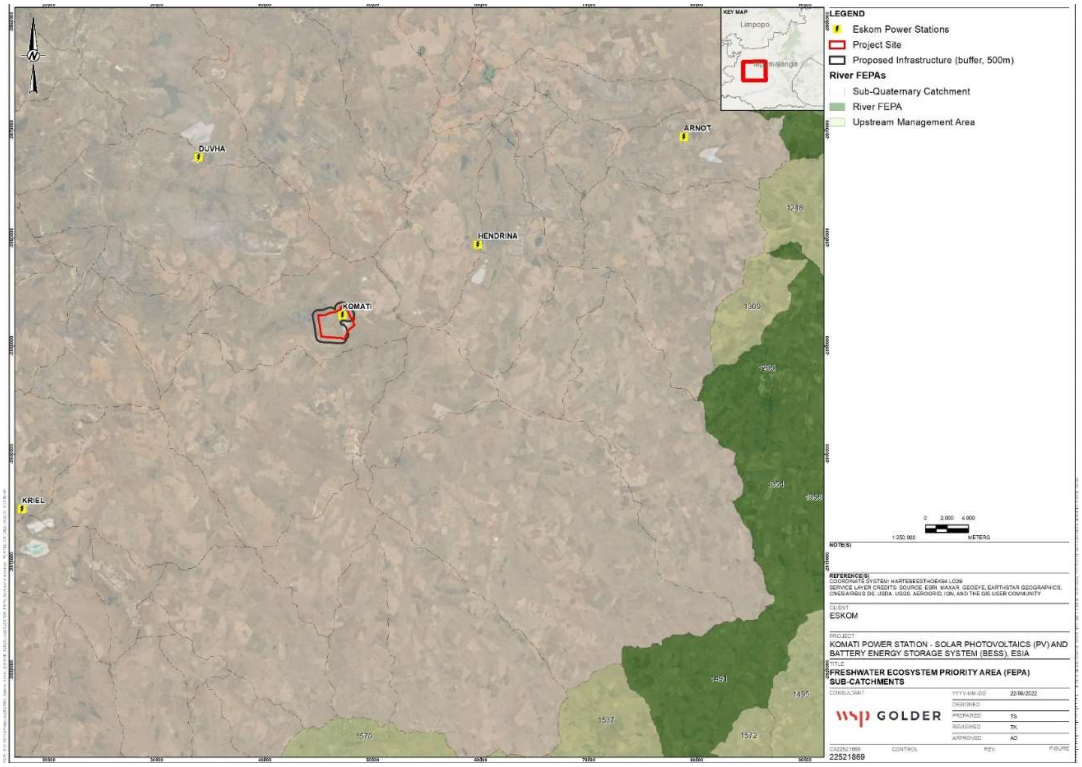


Figure 8-28: Study area in relation to FEPA sub-catchments

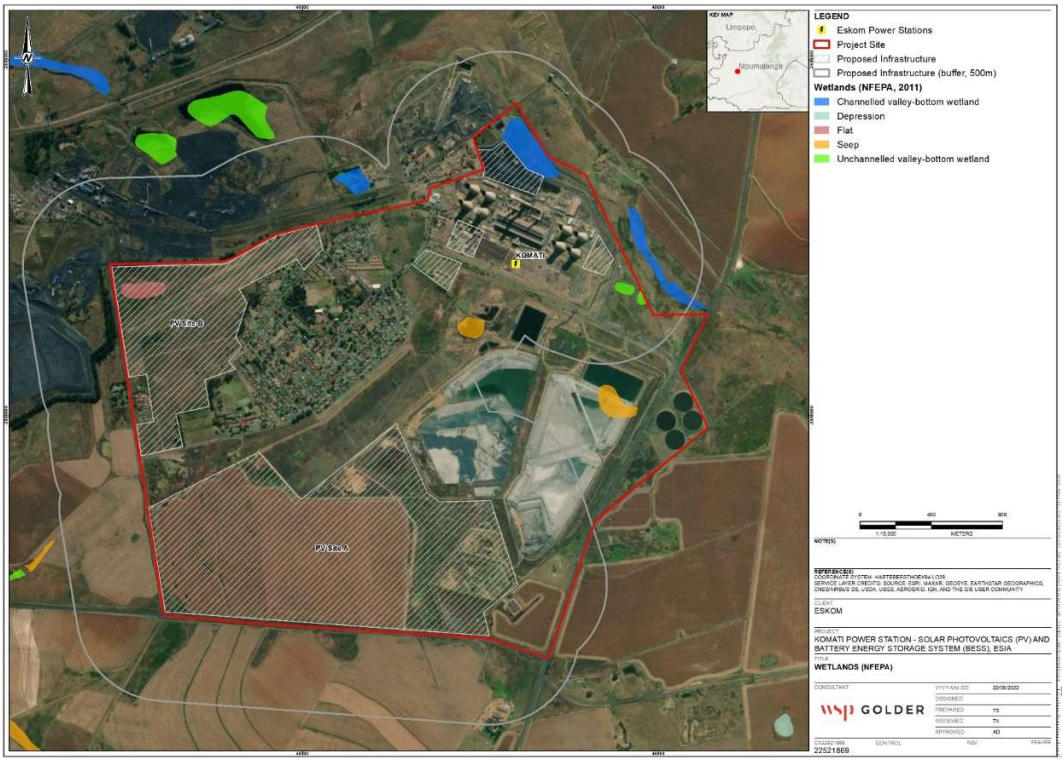


Figure 8-29: Proposed development in relation to NFEPA wetlands (2011)

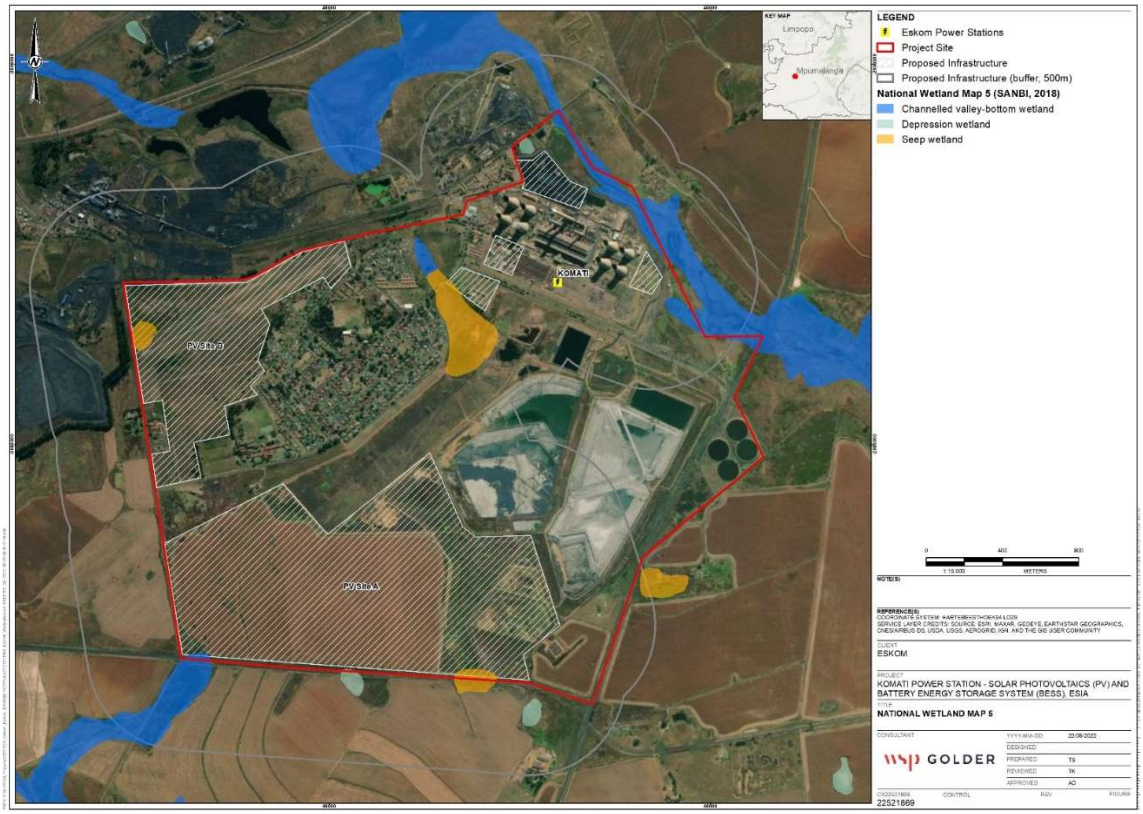


Figure 8-30: Proposed development in relation to NWM5 wetlands (2019)

WETLANDS DELINEATION AND CLASSIFICATION

Four wetlands have been identified to occur within a 500m of the proposed Project development (**Figure 8-36**). 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 8-31** - **Figure 8-33**). 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 8-32**), 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 8-31: An overview of the Channelled valley Bottom wetland (upstream and downstream)

Figure 8-32: 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 8-33**). 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 8-33**). 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 8-33: 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 8-35**), 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 8-34: An overview of the seep wetland: upstream and downstream view

Figure 8-35: 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.

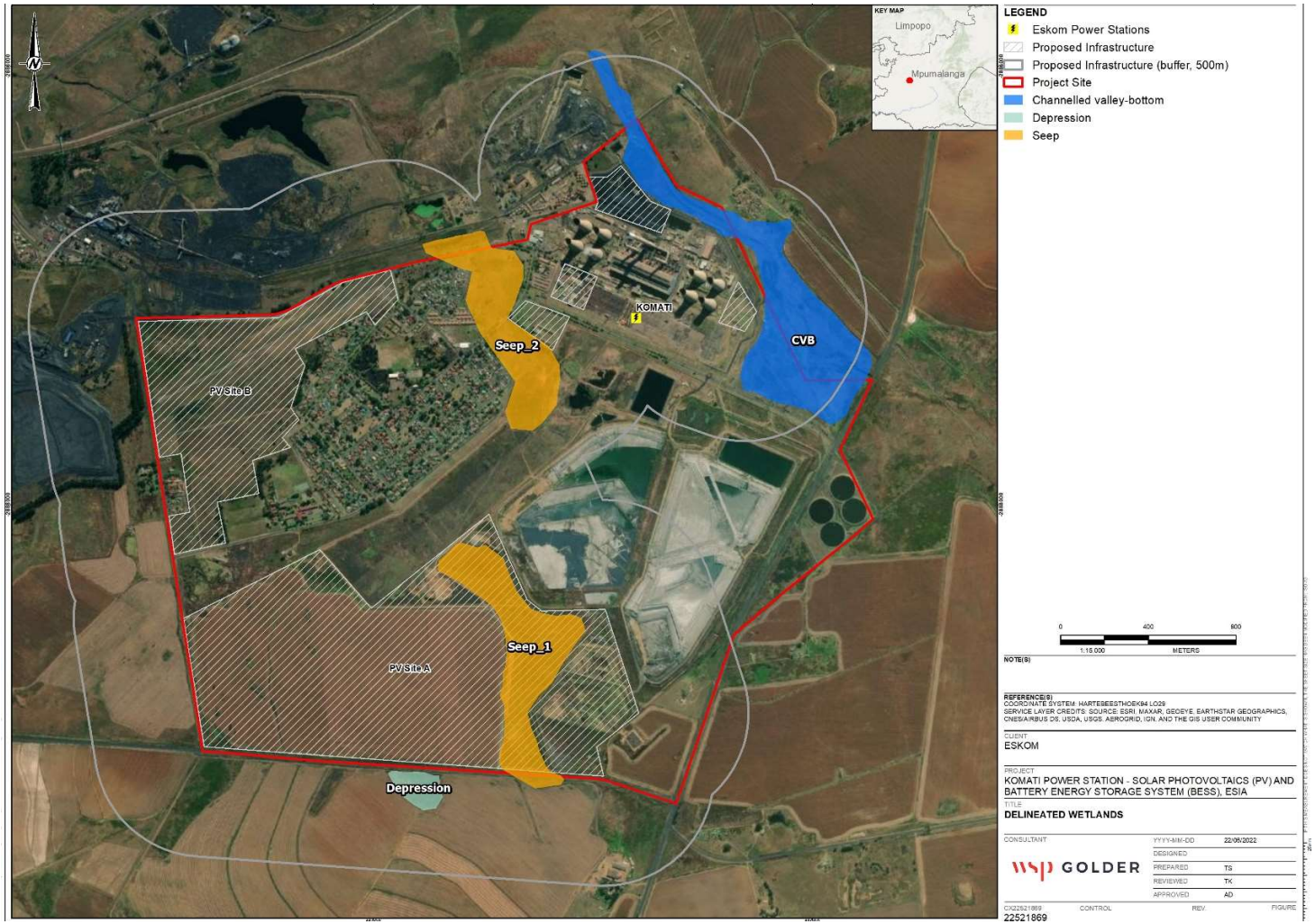


Figure 8-36: Wetland delineation and classification

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 8-17** and discussed in greater detail in the paragraphs that follow.

Table 8-17: 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 8-37)**. 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 8-37: 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 8-38**, 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 8-38**) have changed the hydrological regime of the wetland.

Figure 8-38: 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 8-39**). 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 8-39: 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 8-18**). 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 8-18: 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 8-40**; **Figure 8-41** and **Figure 8-42**. 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 8-40**). 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.

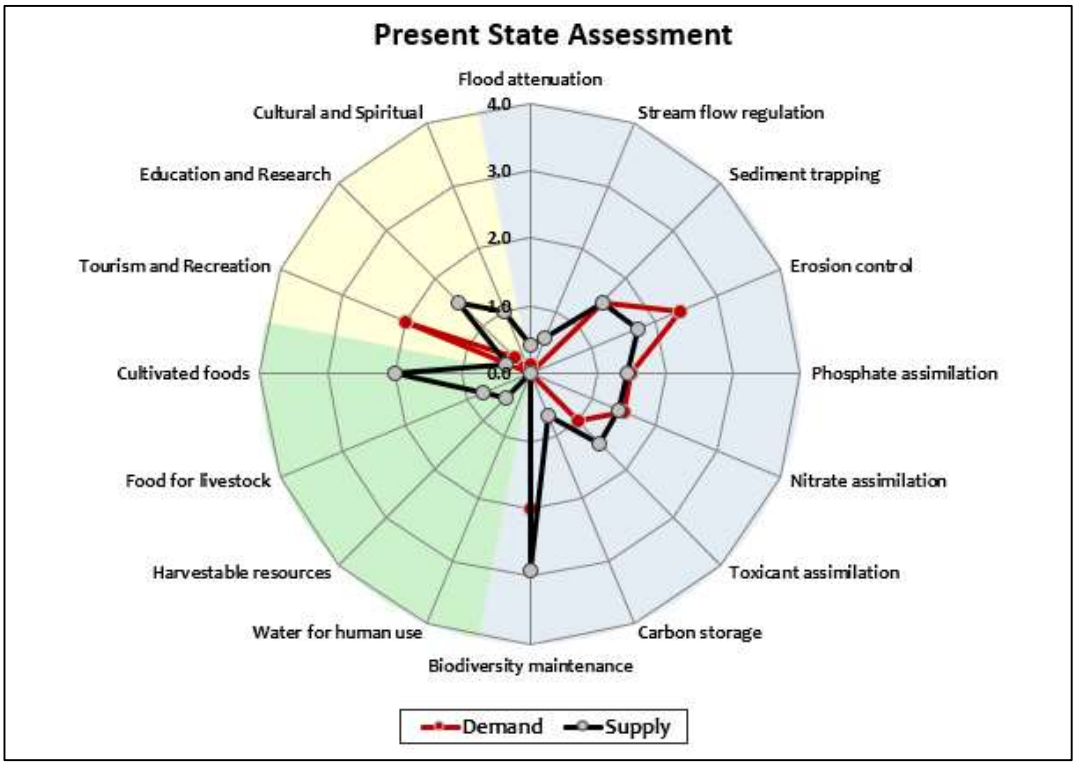


Figure 8-40: Ecosystem Services supplied by/demanded from the CVB wetland.

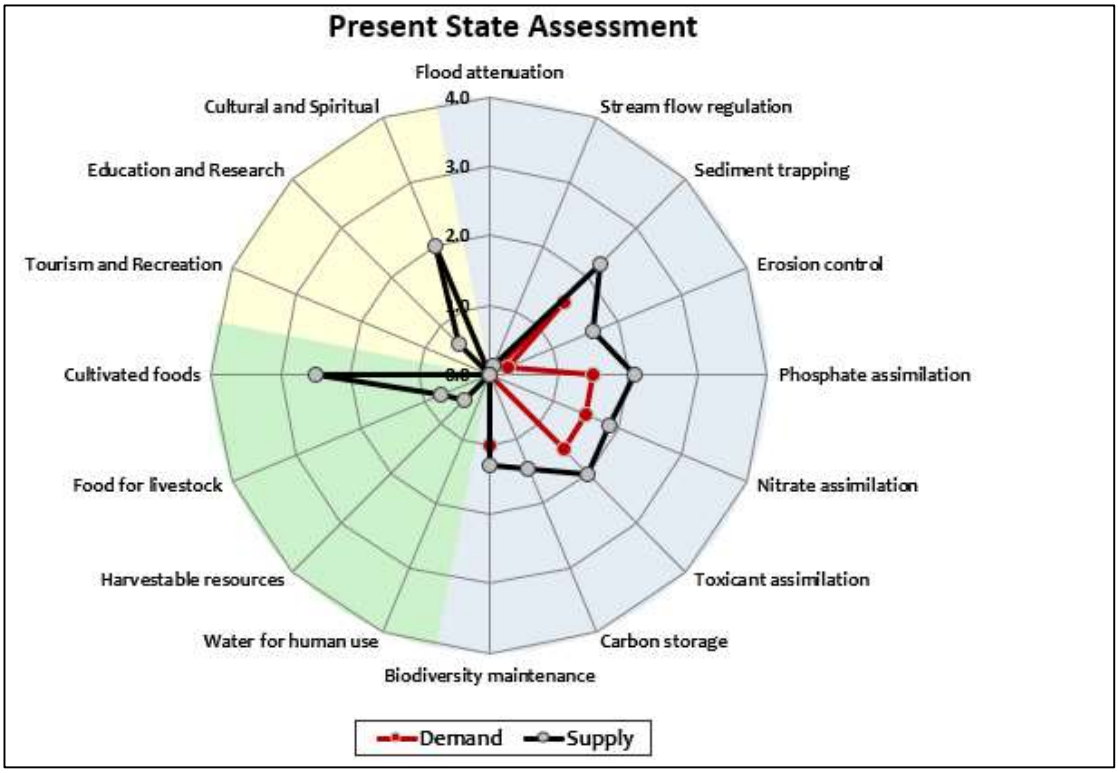


Figure 8-41: Ecosystem Services supplied by/demanded from seep wetlands

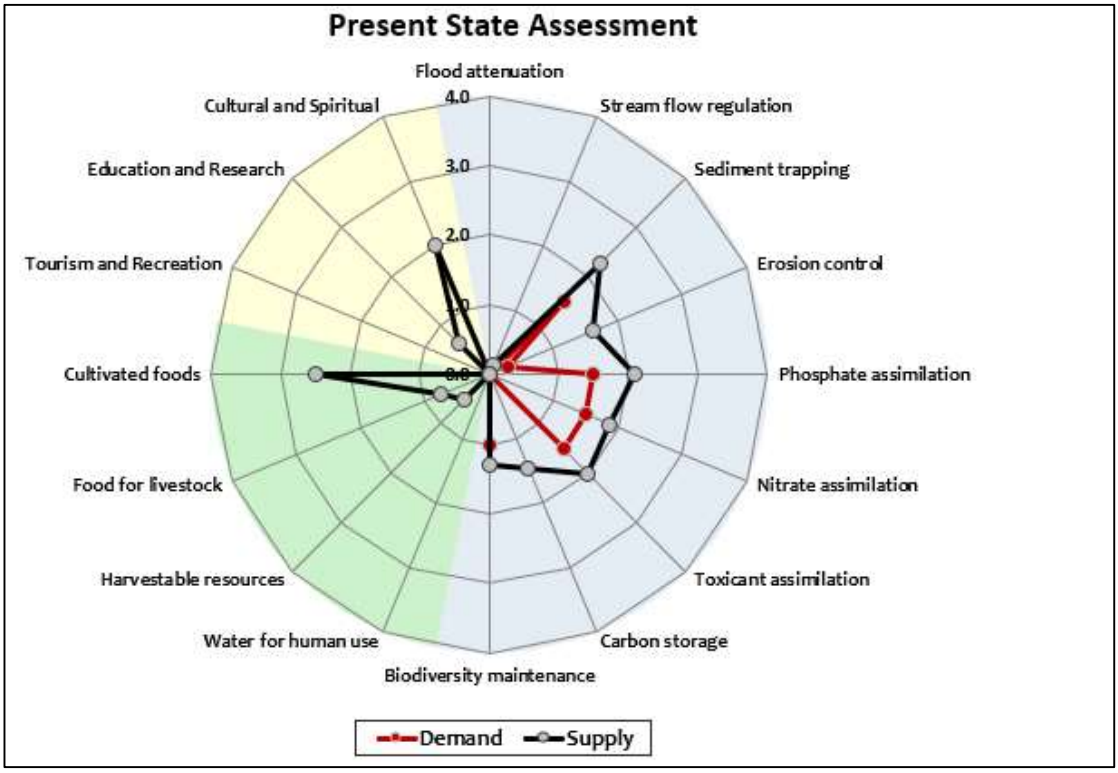


Figure 8-42: Ecosystem Services supplied by/demanded from Depression wetland

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 8-43)** 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.

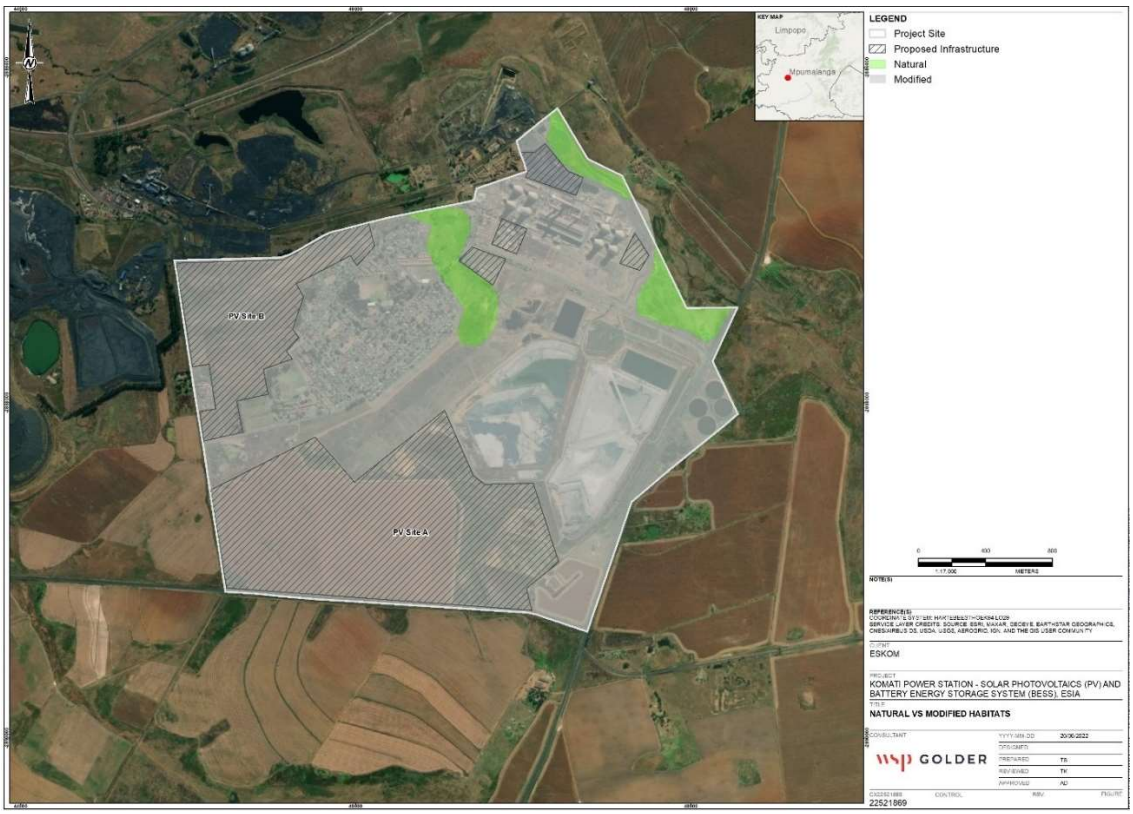


Figure 8-43: Natural, modified and critical habitat

8.3 SOCIAL ENVIRONMENT

8.3.1 TRAFFIC

The following is extracted from the Traffic Impact Assessment compiled by Innovative Transport Solutions (Pty) Ltd (ITS) and included as ***Appendix*** *Error! Reference source not found..*

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 8-44**.

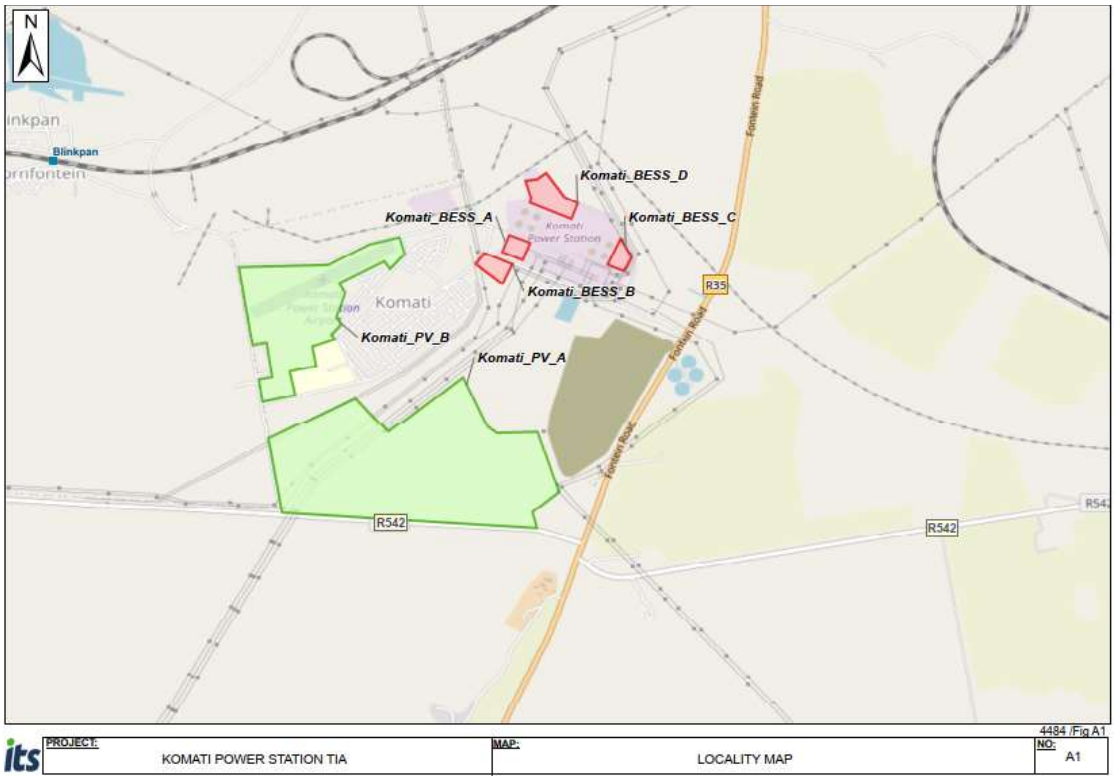


Figure 8-44: Locality map showing roads in the vicinity of the development (ITS, 2022)

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 8-45**, covering a 12- hour period on Wednesday, 1 June 2022.

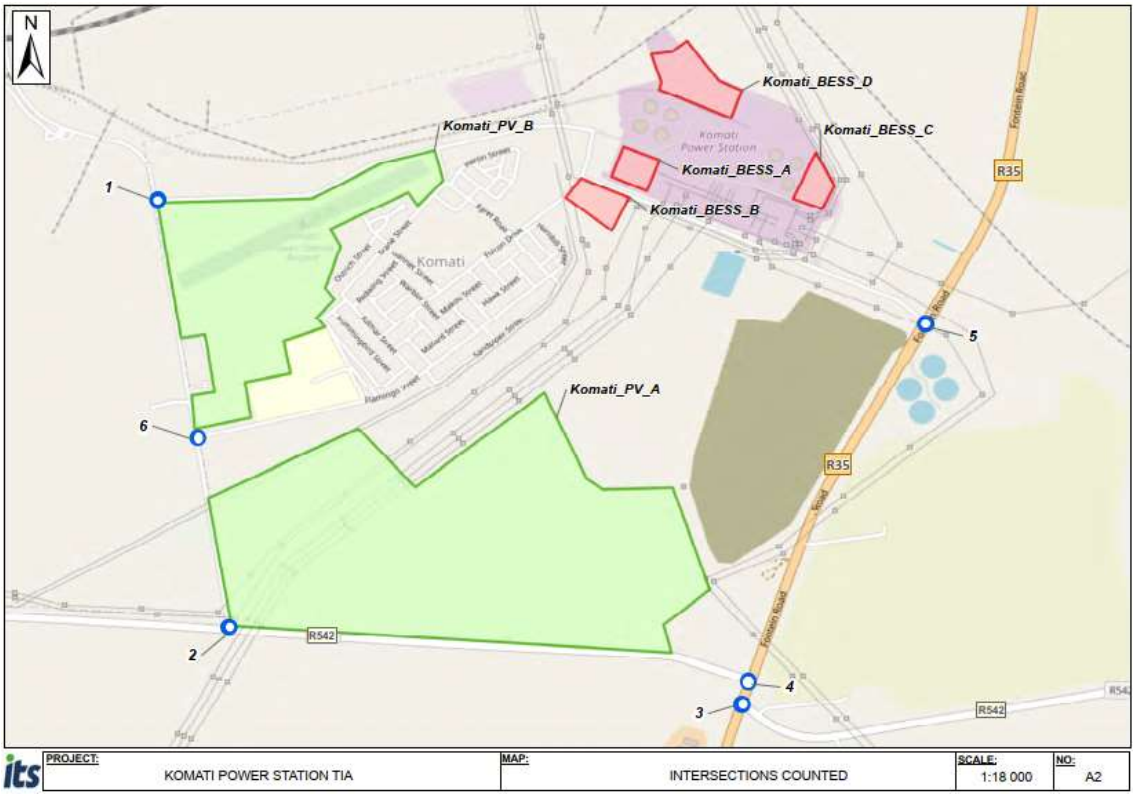


Figure 8-45: Intersections for traffic count

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 8-19** and **Table 8-20**.

Table 8-19: 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 8-20: 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.

8.3.2 VISUAL

The following is extracted from the Visual Impact Assessment compiled by LOGIS and included as ***Appendix*** *Error! Reference source not found..*

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[5]:

- 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

[5] 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 8-46: View of the PV Site A from the R542 arterial road (LOGIS, 2022)

Figure 8-47: View of the PV Site B from the west

Figure 8-48: Typical coal mining activity within the study area

Figure 8-49: General environment within the study area

Figure 8-50: Power lines near the R542 arterial road

Figure 8-51: 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 8-52**). 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 8-53**.

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 ESIA 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 ESIA 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.

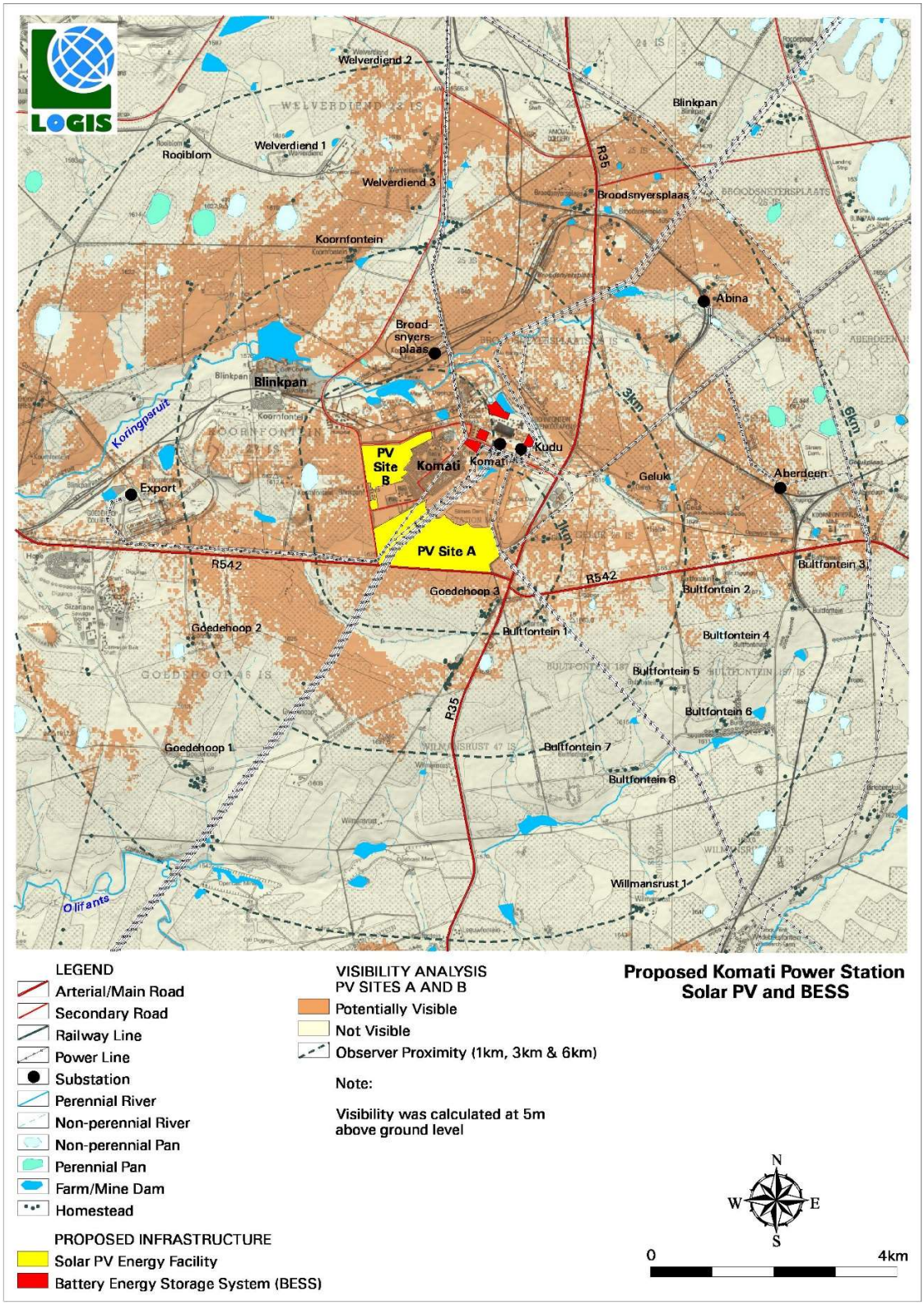


Figure 8-52: Map indicating the potential (preliminary) visual exposure of the proposed Komati Power Station Solar PV Energy Facility

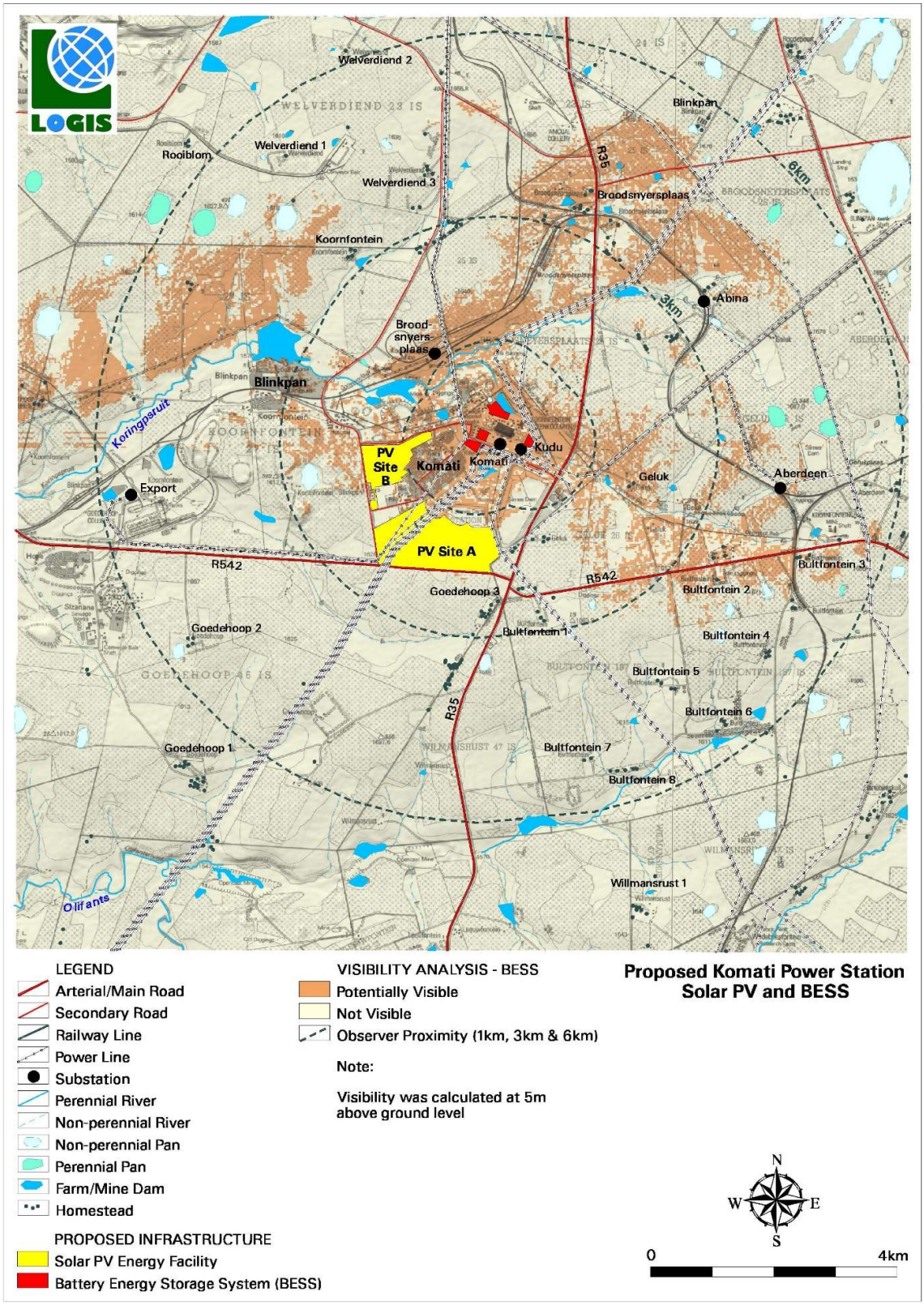


Figure 8-53: Map indicating the potential (preliminary) visual exposure of the proposed Komati Power Station BESS

8.3.3 HERITAGE

The following is extracted from the Heritage Impact Assessment compiled by APAC and included as ***Appendix*** *Error! Reference source not found.*

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.

8.3.4 PALAEONTOLOGY

The following is extracted from the Palaeontology Impact Assessment compiled by Dr H Fourie and included as Error! Reference source not found..

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.

8.3.5 SOCIO-ECONOMIC PROFILE

*The following is extracted from the Social Impact 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 8-54**). 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 8-54: 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 8-55**). The NDM is headquartered in Middelburg. The NDM is the economic hub of Mpumalanga and is rich in minerals and natural resources.

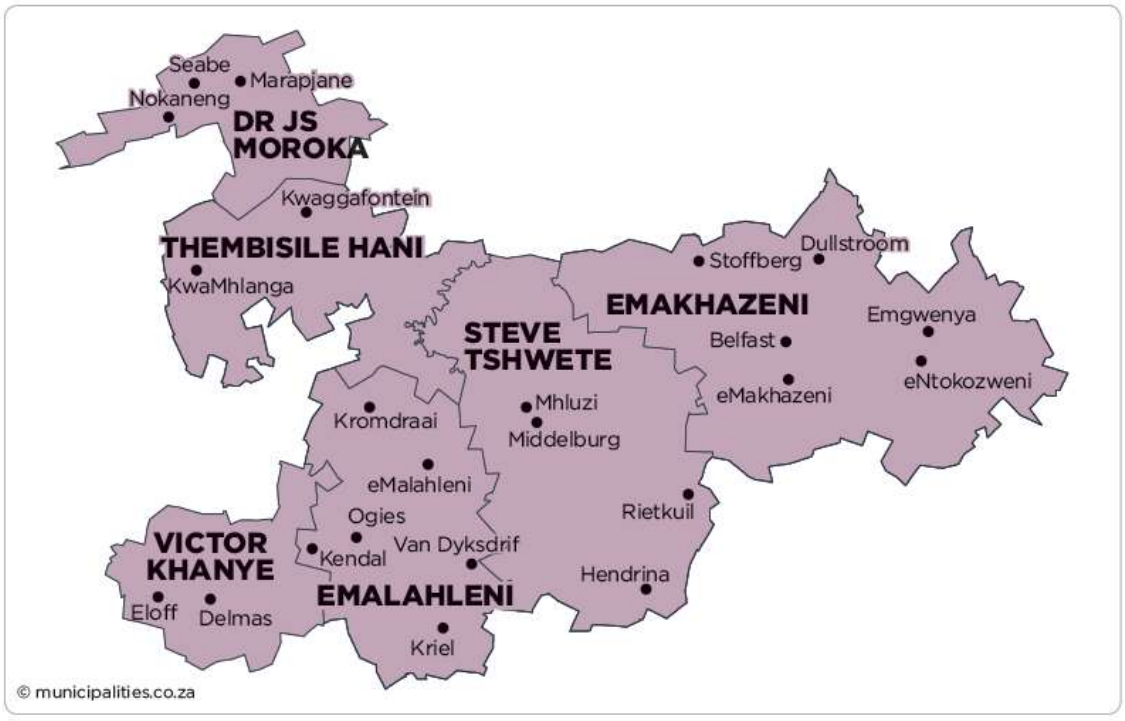


Figure 8-55: Nkangala District Municipality

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 8-55**). 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 8-56**) 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 8-57**).

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.

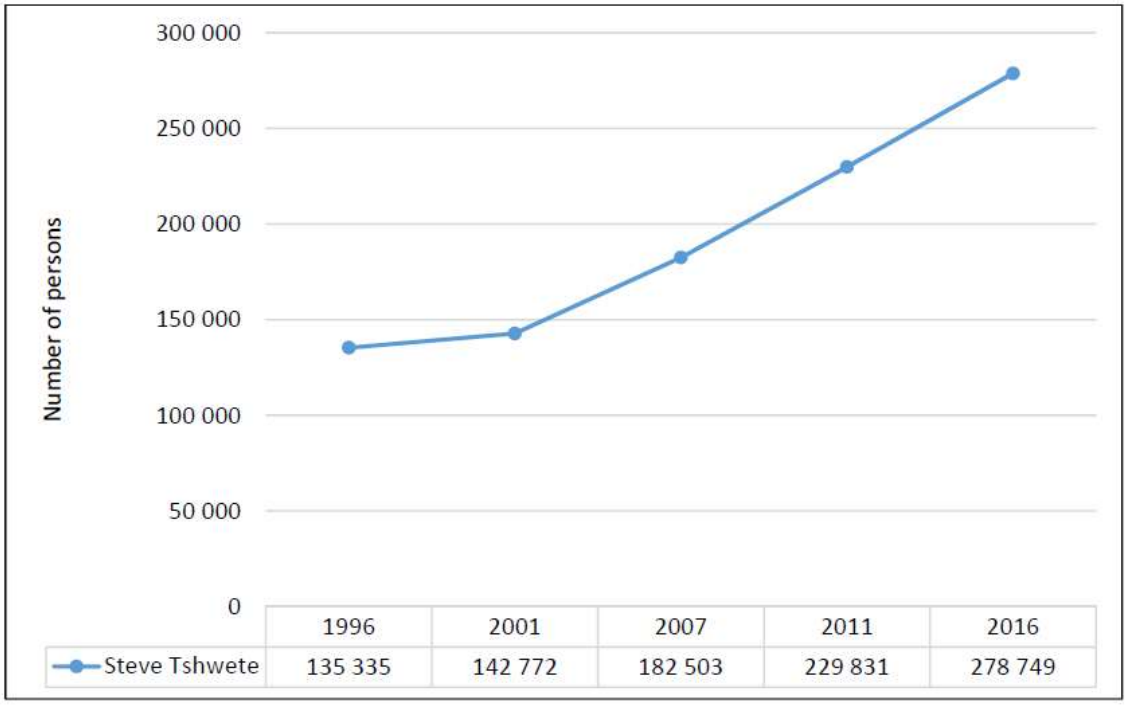


Figure 8-56: STLM population size

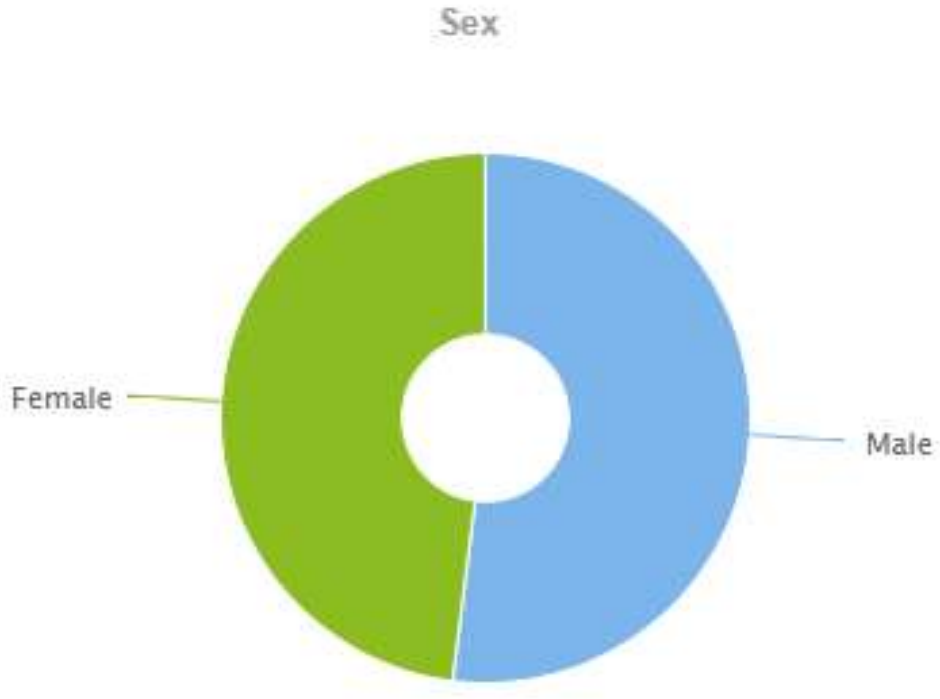


Figure 8-57: STLM gender distribution

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 8-21.**

Table 8-21: 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 8-22**).

Table 8-22: 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 8-23** shows the levels of education represented in the municipality.

Table 8-23: 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 Final ESIA.

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.

9 IDENTIFICATION OF POTENTIAL IMPACTS

Potential impacts that are most likely to be significant have been identified below. These impacts will be investigated further during the Final ESIA Process (Refer to Section 11 for the Plan of Study for the Final ESIA). The impacts have been identified for the Solar PV and BESS Facilities (**Section 9.1**) and the Wind Energy Facilities (**Section 9.2**). The impacts identified are based on the Environmental and Social Sensitives identified in **Section 8.** The significance of the impacts is indicated in **Section 9.3.**

9.1 POTENTIAL IMPACTS FOR SOLAR PV AND BESS FACILITIES

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 9-1**. These impacts and mitigation measures will be further assessed during the Final ESIA Process. The Impact Assessment Rating for these impacts are included in **Section 10.1**.

Table 9-1: 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 as proposed by Component C 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 final ESIA 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 ESIA 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
	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 final ESIA 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 final ESIA 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	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	low given the transformed/disturbed nature of most available habitat. This will be investigated and confirmed during the final ESIA Phase. 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 final ESIA Phase.				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.
	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.	✓	✓	✓	— 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.
	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 final ESIA Phase.		✓		— 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

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					recommended mitigation measures in the BMP is recommended.
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
	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 final ESIA 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.	✓			

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Water quality deterioration and contamination of wetland soils 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		✓		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. — 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.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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 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.	✓	✓	✓	— Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the ESIA 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).

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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				— 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.
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.	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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**
	
	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	✓		✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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. 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.		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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. 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.		✓		
BESS	**Safety and Health Risk** The specific technology and location for the BESS facilities will only be determined following the EPC procurement. There is the potential for fires, explosions, noxious smoke, large spills, traffic accidents and equipment/structural collapse to occur from BESS facilities during construction, operation and decomissioning phases. This includes fire involving fuels used in construction vehicles or vehicles themselves (e.g. tyre fire), fire due to uncontrolled welding or other hot-work. This will result in injuries due to radiation especially amongst first responders and bystanders. Damaged solid-state batteries can release fumes and leak electrolytes. Thermal runaway and hazardous fumes released can cause mild skin irritation from exposure to small leaks to serious corrosive burns or lung damage.	✓	✓	✓	— Following the design and layout of the BESS facilities, a Safety and Health Risk Assessment for the BESS facilities will be undertaken during the Final ESIA Phase. Specific mitigation measures will be proposed following the outcome of the risk assessment. — Isoloated / secure locations should be considered for the location of the BESS facilities where there is limited public access and security access control. These locations should also consider area availability to carry out maintenance activities in a safe manner. — BESS units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered. — The contractor in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					the persons involved in transfer and coordination of emergency response on-route. E.g. if purchased from Tesla where does hand over occur to the South African contractor / owner, at the factory door in USA, at the port in RSA, at the site fence. For example, who will be accountable if there's thermal runway event on a truck with a container that stops in a small town for driver refreshments. — An emergency response plan must be compiled prior to construction and operation, which must include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers. — The company responsible for the facility at this stage is to have: — An emergency plan must be in place prior to commencement of construction. — Fuel spill containment procedures and equipment must be provided for and in place. — Hot-work permit and management system must be in place. — The necessary PPE must be provided and worn at the required working areas. — All necessary health controls/ practices must be in place, e.g. ventilation of welding and painting areas. — Fuels stored on site must be situated in dedicated, demarcated and bunded areas. — Suitable fire-fighting equipment must be available on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc

C: Construction

O: Operation

D: Decommissioning

9.2 POTENTIAL IMPACTS FOR WIND ENERGY FACILITY

The potential environmental and social impacts of the WEF have been identified at a high level and are discussed in **Table 9-2**. These impacts will be further assessed during the ESIA Process. The Impact Assessment Rating for these impacts are included in **Section 10.2**.

Table 9-2: Potential Impacts for WEF

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 and Vibrations	**Noise and Vibration Emissions** The following construction-related activities are likely to generate vibrations and additional noise into the environment: — Presence of workforce — Land clearing — Drilling , blasting, piling — Cut and fill operations — Vehicle activities associated with transport of equipment — Use of equipment and machinery — Concrete mixers and cranes Vibrations and audible increase in noise can lead to the disturbance and nuisance to sensitive receptors. A receptor is defined by the WBG (April 2007) as "any point on the premises occupied by persons where extraneous noise and/or	✓		✓	— 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

	vibration are received". Being such a remotely located site, dominant receptors in the area surrounding the site include small farmsteads and farmhouses.				— 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.
					— Implementation of standard construction phase mitigation measures to be outlined in the ESMP will assist in controlling noise emissions and minimising impacts.
					— The following measures are outlined by the IFC / WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control noise impacts:
					  — Operating turbines in reduced noise mode.
					  — Building walls/appropriate noise barriers around potentially affected buildings (only an option in hilly terrain, due to the height of turbines).
					  — Curtailing turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.
					— A noise modelling study will be carried out during the final ESIA Phase to evaluate the noise impacts on the nearby sensitive receptors and determine the optimal locations for the wind turbines.

	Noise Emissions Principal sources of noise in wind energy facilities include mechanical noise generated from the turbine's mechanical components and aerodynamic noise produced by flow of air over the turbine blades. Mechanical noise is produced by the physical movement of components such as gearbox, generator, yaw drives, cooling fans and auxiliary equipment. Over time, appropriate design and manufacturing have reduced the mechanical noise produced from wind turbines. As such, the aerodynamic noise from the blades has become the dominant source of noise for modern turbines. Aerodynamic noise is typically broadband in nature and is generated by the interaction between air flow and different parts of the turbine blades. In addition to the noise from wind turbines, wind farms require a substation and transformers, which produce a characteristic "hum" or "crackle" noise. Utility companies have experience with building and siting such sources to minimise their impact. Substation-related noise is relatively easy to mitigate should this be required, based on the use of acoustic shielding and careful planning regarding placement away from sensitive receptors. As such, noise associated with this source is not considered in this assessment.		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
Topography and Geology	**Slope Instability** Excavation, drilling and blasting activities have the potential to result in slope instability. It is anticipated that minor impacts to the topography will occur during construction and decomissioning and the impact will be limited to localised areas that is within the turbine positions and ancillary infrastructure.	✓		✓	— Implementation of erosion management measures in line with the Erosion Management Plan and Rehabilitation Plan to be included in the ESMP. — All cleared areas must be revegetated with indigenous vegetation. — Implement an effective stormwater runoff control system, including runoff control features to direct and dissipate water flow from roads and other hardened surfaces. — Progressive rehabilitation will be essential to reduce the potential for soil erosion and sedimentation.
Surface Water	**Stormwater Runoff** Stormwater runoff could, in the case of the temporary construction yards, laydown areas, and offices for the construction 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 wind turbines 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.	✓	✓	✓	— 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.
	Erosion Soil stripping, stockpiling, excavations of underground cabling, foundations for the wind turbines and construction of stormwater berms may result in loss of soils through erosion, particularly for topsoil stockpiles w 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 watercourses, due to sedimentation.	✓	✓	✓	— 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. — Protect structures such as thewind turbine bases from localised flooding by constructing cut-off berms / diverting flow on the uphill side in flood prone areas.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Flooding In the operation phase, soil compaction and erosion may occur due to vehicle movement during routine maintenance. This activity will 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.		✓		— 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. — 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.
Groundwater	**Groundwater Quantity** There are no groundwater quantity impacts identified during construction as water will not be obtained from the groundwater resource. Water will be sourced from the existing Water Treatment Plant at Komati Power Station. During the operational phase the following impact is expected: — Reduced recharge due to increase in hardstanding footprint.	✓	✓	✓	— 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.
	Decrease In Groundwater Quality — Hydrocarbon spills from moving equipment — Leachate/spills from fuel storage areas	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	— 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). — Reduced leachate from contaminated soils as the turbine bases will reduce the exposure of land				— 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.
Terrestrial Biodiversity	**Loss and Fragmentation of Vegetation and Habitat** Temporary fragmentation of vegetation communities can lead to disturbance and potential loss of portion of certain vegetation types and associated floral species assemblages (habitat destruction). Permanent loss of floral Species of Conservation Concern (SCC) may occur if the proposed site footprint, construction activities and location of wind turbines take place within sensitive habitat units. This will be investigated and confirmed during the final ESIA Phase.	✓	✓	✓	— The preferred project layout must avoid sensitive habitats as far as possible. — Minimise development footprint within high sensitivity areas and ensure that final development layout takes account of areas identified as sensitive during the field survey. Some avoidance and changes to the layout may be required if some areas with a high abundance of species of concern are shown to occur within the preferred development areas. — Sensitive faunal habitats such as drainage lines and wetlands must be avoided.
	Loss and Displacement of Fauna The construction of project infrastructure will require the clearance vegetation. These activities may cause disturbance and displacement of local fauna (including possible threatened or protected species) due to habitat loss;	✓	✓	✓	— Detailed biodiversity assessment is required to determine sensitivity, quantify potential impacts to flora and fauna, and provide for recommendation of mitigation measures. — Alien and invasive vegetation control should take place throughout the duration of the construction and operation

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	and/or direct mortalities. Although it is assumed that most fauna species will move to different areas because of disturbance, some protected fauna species have very specific habitat requirements, and the disturbance of sensitive habitats will result in displacement to less optimal habitats. This will be investigated and confirmed during the full ESIA Phase. Secondary impacts associated include the destruction and disturbance to local breeding grounds and nesting sites, leading to potential decrease in population densities of threatened and protected species. If development takes place within the sensitive habitats permanent loss of faunal SCC carrying capacity will potentially occur. This will be investigated and confirmed during the final ESIA Phase. Some mammals and reptiles would be vulnerable to illegal collection or poaching during the construction phase from construction workers.				phases. An alien management plan must be part of the ESMP. – The main mitigation measures, other than required Management Plans for plant rescue, rehabilitation, and alien plant management, are related to infrastructure location, which is a planning phase measure. Specific recommendations will form part of the outcome of the ESIA.
	Proliferation of alien invasive plant species The disturbance associated with construction and decomisioning activities of the project will render the disturbed areas vulnerable to alien plant invasion. Some alien plant invasion is inevitable and regular alien plant clearing activities would be required to limit the extent of this problem. Once the natural vegetation has returned to the disturbed areas, the site will be less vulnerable to alien plant invasion, however, the roadsides and turbine service areas are likely to remain the focus of alien plant invasion for years. This will be investigated and confirmed during the final ESIA Phase. Proliferation of alien invasive plant species has the potential to manifest during the operational phase. In addition, the presence of the wind turbines and daily operational activities at the site may deter certain species from the area, resulting in a loss in broad-scale landscape connectivity.	✓	✓	✓	
Avifauna	**Displacement due to disturbance during the Construction Phase**	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES

	Displacement of avifauna may take palce due to the distrubance factor associated with construction acitivites, the operating of turbines and desomissionung activities. This will be investigated and confirmed during the final ESIA Phase.				— Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible.
					— Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.
					— Measures to control noise and dust should be applied according to current best practice in the industry.
					— Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
					— It is recommended that suitable pro-active mitigation be implemented at all turbines, which could include shut down on demand or other proven mitigation measures.
					— A raptor-friendly pole design must be used, and the pole design must be approved by the avifaunal specialist
					— All internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the Eskom standard.
					— The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts:
					  — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility, such as water bodies, perching or nesting areas, novel feeding areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites.
					  — Avoid attracting birds to predictable food sources, such as on-site or off-site waste disposal areas, or landfills; this is especially relevant when vultures or other carrion-eating birds are present. These types of mitigation measures may also need to be carried out in the surroundings of the wind energy facility in order to be effective.

	Collisions Mortality on wind turbines The wind turbines may pose a collision risk to several species which could occur regularly at the site. This will be investigated and confirmed during the final ESIA Phase.		✓		
	Electrocution on the medium voltage network Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen 2000). The electrocution risk is largely determined by the design of the electrical hardware. This will be investigated and confirmed during the final ESIA Phase. While the intention is to place the low voltage reticulation network underground where possible, there are areas where the lines might have to run above ground, for technical reasons. In these instances, the electricity could potentially pose an electrocution risk to several species that could on occasion perch on these poles. This will be investigated and confirmed during the final ESIA Phase.		✓		
	Collisions with overhead lines Collisions are the biggest threat posed by overhead lines to birds in Southern Africa (Van Rooyen 2004). This will be investigated and confirmed during the final ESIA Phase.		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					— Consider adjustments of cut-in wind speeds to reduce potential bat collisions. The feasibility of this measure should be informed by species- and site-specific data. A slight increase in cut-in wind speed may have the potential to achieve significant reductions in bat fatalities, with minimal reduction in generation or financial returns. — Eliminate "free-wheeling" (free spinning of rotors under low wind conditions when turbines are not generating power). — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate
Bats	**Loss of foraging habitat by clearing of vegetation** Foraging habitat may be permanently lost by construction of turbines, crane pads, infrastructure and access roads as well as activities associated with decomissioning. This will be investigated and confirmed during the final ESIA Phase.	✓		✓	— Adhere to the sensitivity map criteria. Rehabilitate cleared vegetation where possible at areas such as laydown yards. — Turbine layout adjustments to adhere to the sensitivity map, and where needed, reducing blade movement at selected turbines during high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled.
	Roost destruction during earthworks Destruction of bat roosts may occur due to earthworks and blasting. During construction and decomissioming, the earthworks and especially blasting can damage bat roosts in rock crevices. Any type and duration of blasting in close proximity to a rock crevice roost or man-made structure (barns, sheds, abandoned houses, pump houses etc.), can cause mortality to the inhabitants of the roost. This will be investigated and confirmed during the final ESIA Phase.	✓		✓	— Reducing blade movement at selected turbines if a migration route is discovered. Acoustic deterrents are developed well enough to be trialled. — Only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. This will be at turbine bases (if applicable, and other infrastructure buildings). For buildings, avoid tin roofs and roof structures that offer entrance holes into the roof cavity. — Curtailment that increases cut-in speed.
	Bat mortalities during foraging		✓		— Curtailment to prevent freewheeling

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	Bat mortalities due to direct blade impact or barotrauma during foraging activities (not migration). If the impact is too severe (e.g. in the case of no mitigation) local bat populations may never recover from mortalities. This will be investigated and confirmed during the final ESIA Phase.				— Acoustic bat deterrents (Investigated during the final ESIA phase) — Minimising light pollution on site — The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts: — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility,such as water bodies, perching or nesting areas, novel feeding areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites. — Consider adjustments of cut-in wind speeds to reduce potential bat collisions. The feasibility of this measure should be informed by species- and site-specific data. A slight increase in cut-in wind speed may have the potential to achieve significant reductions in bat fatalities, with minimal reduction in generation or financial returns. — Eliminate "free-wheeling" (free spinning of rotors under low wind conditions when turbines are not generating power). — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate
	Bat mortalities during migration Mortalities of bats due to wind turbines during migratory activities can have significant ecological consequences as the bat species at risk are insectivorous and thereby contribute significantly to the control of nocturnal flying insects. On a project specific level, insect numbers in a certain habitat can increase if significant numbers of bats are killed off. But if such an impact is present on multiple projects in close vicinity to each other, insect numbers can increase regionally and possibly cause outbreaks of colonies of certain insect species. Additionally, if migrating bats are killed it can have detrimental effects on the ecology of the caves that a specific colony utilises. This will be investigated and confirmed during the final ESIA Phase.		✓		
	Increased bat mortalities due to light attraction and habitat creation During operation, artificial lights that may be used at the turbine base or immediately surrounding infrastructure will attract insects and thereby also bats to the turbines. This will significantly increase the likelihood of mortality from collision with turbine blades of bats foraging around such lights. This will be investigated and confirmed during the final ESIA Phase.		✓		
Aquatic Biodiversity	**Direct Loss of Wetland Habitat** Site establishment and construction of the proposed project infrastructure, 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.

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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.	✓	✓		— 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 — 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
	Catchment Land Use Changes and Activities Bulk earthworks involved in site development for construction and decomissioning activities 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.	✓		✓	
	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 final ESIA Phase.	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					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 historical records should appropriate management measures not be in place (e.g. Chance Find Procedure).	✓			

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
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 Surrounding Community** There will be some visual impacts on motorists and surrounding community 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 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 During operation there may be visual impact on the following receptors: — Potential alteration of the visual character of the area; — Potential visual intrusion resulting from wind turbines dominating the skyline in a largely natural / rural area; — Potential visual clutter caused by substation and other ancillary infrastructure on-site. — Potential visual effect on surrounding community; — Visual impact of shadow flicker impact, and motion-based visual intrusion, and — Potential alteration of the night time visual environment as a result of operational and security lighting as well as navigational lighting on top of the wind turbines.	✓	✓	✓	— Steep slopes should be avoided, erosion control measures, and revegetation procedures implemented. — 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. — Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. — Vegetation clearing should take place in a phased manner. — Make use of existing gravel access roads where possible. — Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible. — Ensure that dust suppression techniques are implemented: — on all access roads; — in all areas where vegetation clearing has taken place; — on all soil stockpiles. — Maintain a neat construction site by removing litter, rubble and waste materials regularly. — Turbine colours should adhere to CAA requirements. Bright colours and logos on the turbines should be kept to a minimum. — Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work).

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
					— If turbines need to be replaced for any reason, they should be replaced with the same model, or one of equal height and scale to lessen the visual impact. — As far as possible, limit the number of maintenance vehicles which are allowed to access the site. — Ensure that dust suppression techniques are implemented on all gravel access roads. — 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. — Lighting fixtures should make use of minimum lumen or wattage. — Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used. — 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.
	Shadow Flicker Shadow flicker may occur when the sun is low on the horizon and shines through the rotating blades of a wind turbine, resulting in a moving shadow. The rotating blades repeatedly cast a shadow which will be perceived as a "flicker" and this flicker effect can potentially impact on residents located near the wind turbines. The effect of shadow flicker is however only likely to be experienced by people situated directly within the shadow cast by the blade of the wind		✓		— A shadow flicker impact assessment for the wind turbines will be undertaken by the visual specialist during the Final ESIA based on expert judgement. Specific mitigation measures will be provided by the specialist hoewver the following should be considered: — The positions of the turbines should take into considertaion the orientation of the turbines relative to the nearby houses and the latitude of the site. — Consider planting a treeline along the boundary of each facility to obstruct shadows and prevent the effect of

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	turbine. As such, shadow flicker is only expected to have an impact on, and cause health risks to, people residing in houses located relatively close to a wind turbine and at a specific orientation, particularly in areas where there is little screening present. Shadow flicker may also be experienced by and impact on motorists if a wind turbine is located in close proximity to an existing road.				shadow flicker from impacting on surrounding residents.
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.	✓		✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES

Social	**Economic Impact**
	
	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 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.
		✓	✓	✓	— 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, noise affects surrounding communities differently, and the additional noise impacts which will be coming from the facilities. The construction of facilities can result in traffic and resources are being transported. Waste material that results from the construction could be detrimental to aesthetics and nearby community. Social ills may also increase in the area with construction known to result in an influx of people from further afield seeking employment opportunities.	✓	✓	✓	

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	The limited opportunities may result in increased unemployment in the area and thus increased crime. Construction 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. 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.				
	Health and Safety **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		✓		

ASPECT	IMPACT	C	O	D	MITIGATION MEASURES
	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. The proposed location of the wind turbines (as indicated in Figure 5-4) are not within any formal or informal communities. The displacement of communties is therefore not likely to occur.	✓	✓		

C: Construction

O: Operation

D: Decommissioning

9.3 CONTAMINATED LAND

In this context, the known plume associated with the Ashing Area expectedly dominates the signature of down-gradient groundwater quality with manganese at a concentration (1,718.3 µg/l) above both the drinking water chronic health standard (400 µg/l) and freshwater aquatic guideline (180 µg/l). While this plume has been shown to extend off-site to the north, seemingly additional contributions from the Komati Power Station and particularly the coal stockyard (BESS D) are also observed with a doubling in the concentration of manganese recorded at BH01 (3,269.5 µg/l). The likely lateral dispersivity of this plume is also apparent at BH05 to the northeast and BH06 to the west where manganese concentrations of 809.5 µg/l and 496.8 µg/l were respectively recorded. Manganese was not otherwise recorded above either its freshwater aquatic guideline or chronic health standard for drinking water; although was noted to be above its aesthetic drinking water standard at BH04 (BESS B).

Compared to the background range (6.2–10 µg/l) concentrations of zinc appear elevated within the shallow groundwater across the entire property (16.2–59 µg/l). While far below the drinking water standard of 2 000 µg/l, these are above both the Target Water Quality Range (TWQR) and Chronic Effect Value (CEV) of 2 µg/l and 3.6 µg/l, respectively for aquatic ecosystems, and also above the Acute Effect Value (AEV) of 36 µg/l in four of ten boreholes (40%) sampled under the current scope. This includes positions both up- and down-gradient and therefore the source of zinc remains uncertain.

While absent in the background, lead has been detected within all shallow groundwater samples obtained. Notably, however, this is an approximate order of magnitude greater, and above the drinking water standard, within the west of the property (BH06, BH07 and BH08 [PV Site A] and BH09 [PV Site B]). While the combustion of fossil fuels (i.e. coal) is a recognised source of environmental lead, the reason for the noted distribution is uncertain and therefore remains unconfirmed; however, appears to correlate with typically higher concentrations of lead in soils in the west of the premises.

Exceedances of the adopted standards/guidelines does not necessarily confirm the presence of an unacceptable risk but provides a conservative indication of where the shallow groundwater may represent a source of impact for the identified receptors. **It is understood (VPC, 2021) that rehabilitation and management is planned for the plume associated with the Ashing Area and, as such, long term improvements in the quality of shallow groundwater would be expected once this process is implemented. While the sources of lead and zinc cannot be categorically confirmed these are almost certainly related to the activities at both Komati Power Station and the neighbouring colliery, and more detailed assessment/s are recommended to ensure appropriate protection of any potential receptors.** Otherwise, the demonstrated impacts to shallow groundwater are not considered to represent substantial constraints to the proposed development specific to the two PV and four BESS sites.

When considering the approach to assessment as defined by the Framework for the Management of Contaminated Land and taking cognisance of the CSM, the magnitude of impact is largely not considered to represent a significant source of risk with respect to human health and/or aquatic systems when specifically considering the end-use of the areas of concern. There will, however, be a requirement to ensure appropriate management of excavations, and especially where these are required within areas proximal to residential dwellings of Komati. Further, although contributory impacts to groundwater contamination is evident at the Coal Stockyard (BESS D), this source will be removed during the decommissioning of this facility.

The NEM: WA provides the following definition of 'contaminated':

> *"the presence in or under any land, site, buildings or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which substance or micro-organism directly or indirectly affects or may affect the quality of soil or the environment adversely"*

Therefore, and taking cognisance of Section 37(2) of the NEM: WA, it is WSP's opinion that the proposed development areas would likely be regarded as 'contaminated' based on definition, with certain determinants clearly being above a 'normal' level. However, recognising the outcomes of the risk assessment, in terms of Section 38(1)(c) of the NEM: WA it is also considered likely that the demonstrated contamination specific to these areas "*does not present an immediate risk, but that measures are required to address the monitoring and management of that risk*".

As stated above, contaminated groundwater from the Ashing Area has been shown to extend to the north towards the Koringspruit. WSP understands that this is currently under investigation with an updated groundwater model in progress. The potential impact from future undermining of the PV Site A should be considered as part of this study and this may influence the planned remediation of the groundwater plume.

The preliminary nature of this report is again stressed. WSP understands that further geotechnical investigations are planned by Eskom. Additional and more comprehensive intrusive works will almost certainly be necessary to validate the findings herein as well as to prepare a Site Assessment Report (SAR) for authority submission. This may need to be a consolidated submission to the DFFE covering the entirety of the Eskom premises and, as such, liaison with the authorities at the earliest opportunity is recommended. In this regard attention is also drawn to the implications of existing environmental authorisations (i.e. WUL and WML) within the areas of proposed development that will likely require separate management to the process applicable to Part 8 of the NEM: WA (i.e. provision for a Remediation Order).

9.4 WASTE MANAGEMENT

Table 5-5 describes the different waste products that the proposed project will produce, as well as the various options to dispose of them. The majority of waste will mainly be generated during the construction and decommissioning phases.

Table 9-3: Waste Management Options

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
Hydrocarbons (Contaminated soil)	Hazardous	Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: — Using spill kits to clean any spillages; — Ensure storage facilities are maintained and meet industry regulations; — Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; — Waste generated must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	PPE can be contaminated during handling of hydrocarbons. Management options include: — Store contaminated PPE in hazardous waste skips at the project area; — Waste generated along must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Solar Panels, Wind Turbines and BESS Components	Hazardous	During operation, solar panels, wind turbines and BESS facilities can get damaged resulting in hazardous waste. Disposal methods for Solar Panels, Wind Turbines and BESS facilities are still being investigated and will be further developed at

WASTE	TYPE OF WASTE	MANAGEMENT OPTIONS
		the appointment of the Engineering and Procurement Contractor. All other hazardous waste from these components that can be disposed of, will be disposed of correctly at a licenced facility. Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators.
Construction waste	General	— Provisions of suitable waste receptacles for temporary storage of general and hazardous waste (in compliance with Material Safety Data Sheets). — Waste generated along must be taken to the contractor laydown area at the end of each day; and — Co-ordinate waste removal with the general removal of waste from the contractor laydown area. — Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators.
General waste	General	General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include: — Ensure waste is stored securely in refuse bins; — Waste generated along must be taken to the contractor laydown area at the end of each day; and — Co-ordinate waste removal with the general removal of waste from the contractor laydown area. — Despite the modest volumes of waste anticipated to be generated by the Project, recycling opportunities should be sought in order to reduce the volume of waste to landfill and harness commercial benefits for both the project team and local community.
Food waste	General	Food waste is generated as site personnel take their meals on the construction site. Management options include: — Store any waste and packaging into a labelled food waste bin; — Waste generated along must be taken to the contractor laydown area at the end of each day; — Co-ordinate waste removal with the removal of waste from the contractor laydown area; and — Co-ordinate waste removal with the general removal of waste.
Sanitation	Temporary ablution facilities (chemical toilets)	Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators.

9.5 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact assessment for the proposed project were preliminary assessed and is expected to be of low significance. The Final ESIA will assess the cumulative impact of the project in detail using the methodologies prescribed in the IFC Good Practice Handbook on Cumulative Impact Assessments.

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities (IFC GPH).

A cumulative impact assessment is the process of (a) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time, and (b) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible (IFC GPH).

The cumulative impacts identified 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.

10 DRAFT ESIA IMPACT SIGNIFICANCE

The significance of the impacts identified in **Section 9** have been calculated below. The significance is based on two criteria, namely probability; and consequence**,** where the latter is based on general consideration to the intensity, extent, and duration. Refer to **Section 3.3** for an outline of the methodology used. The WB mitigation hierarchy in ESS 1 has the following approach:

- Anticipate and avoid risks and impacts;
- Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;
- Once risks and impacts have been minimized or reduced, mitigate; and
- Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

This approach was considered in the identification and mitigation of impacts for this project. The final ESIA will refine the impacts and mitigation measures as indicated in Section 11.

10.1 SOLAR PV AND BESS

10.1.1 DRAFT ESIA IMPACT SIGNIFICANCE ASSESSMENT

This section provides an overview of the likely significance of construction phase (**Table 10-1**), operational phase (**Table 10-2**) and decommissioning phase (**Table 10-3**). This is used as a guide to determine whether additional assessment may be required in the ESIA phase. Impacts will be refined and assessed during the Final ESIA phase.

Table 10-1: 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**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**	
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**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**	
	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**	
BESS	Safety and Health Risk	Negative	2	3	**Medium**	**Yes**

Table 10-2: 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**	
	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**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**
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 10-3: 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**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
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**
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**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**	

10.1.2 PROPOSED MITIGATION MEASURES

The possible mitigation measures that could be applied to the potential impacts identified in **Section 10.1.1** are shown in **Table 10-4**, **Table 10-5**, and **Table 10-6.** These mitigation measures are preliminary and will be refined during the Final ESIA Phase where the specialists will undertake detailed impact assessments.

Table 10-4: 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.

ASPECT	MITIGATION MEASURES
	— 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. — 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 as proposed by Component C 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.

ASPECT	MITIGATION MEASURES
	— 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.
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 ESIA 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

ASPECT	MITIGATION MEASURES
	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 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.

ASPECT	MITIGATION MEASURES
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 ESIA 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

ASPECT	MITIGATION MEASURES
	— 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.
BESS	— Following the design and layout of the BESS facilities, a Safety and Health Risk Assessment for the BESS facilities will be undertaken during the Final ESIA Phase. Specific mitigation measures will be proposed following the outcome of the risk assessment. — Isoloated / secure locations should be considered for the location of the BESS facilities where there is limited public access and security access control. These locations should also consider area availability to carry out maintenance activities in a safe manner. — BESS units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered. — The contractor in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of the persons involved in transfer and coordination of emergency response on-route. E.g. if purchased from Tesla where does hand over occur to the South African contractor / owner, at the factory door in USA, at the port in RSA, at the site fence. For example, who will be accountable if there's thermal runway event on a truck with a container that stops in a small town for driver refreshments. — An emergency response plan must be compiled prior to construction and operation, which must include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers. — The company responsible for the facility at this stage is to have: — An emergency plan must be in place prior to commencement of construction. — Fuel spill containment procedures and equipment must be provided for and in place. — Hot-work permit and management system must be in place. — The necessary PPE must be provided and worn at the required working areas. — All necessary health controls/ practices must be in place, e.g. ventilation of welding and painting areas. — Fuels stored on site must be situated in dedicated, demarcated and bunded areas. — Suitable fire-fighting equipment must be available on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc

Table 10-5: 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 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).

ENVIRONMENT	MITIGATION MEASURES
	— 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 ESIA 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.
BESS	— Following the design and layout of the BESS facilities, a Safety and Health Risk Assessment for the BESS facilities will be undertaken during the Final ESIA Phase. Specific mitigation measures will be proposed following the outcome of the risk assessment. — An emergency response plan must be compiled prior to construction and operation, which must include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.

ENVIRONMENT	MITIGATION MEASURES
	— The necessary PPE must be provided and worn at the required working areas. — All necessary health controls/ practices must be in place, e.g. ventilation of welding and painting areas. — Fuels stored on site must be situated in dedicated, demarcated and bunded areas. — Suitable fire-fighting equipment must be available on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc

Table 10-6 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.

ASPECT	MITIGATION MEASURES
	— 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 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. — 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.

ASPECT	MITIGATION MEASURES
	— 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 ESIA 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 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.

ASPECT	MITIGATION MEASURES
Visual	— Assessment of recommended mitigation measures and/or infrastructure placement alternatives will be undertaken during the ESIA 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.
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).

BESS	— Following the design and layout of the BESS facilities, a Safety and Health Risk Assessment for the BESS facilities will be undertaken during the Final ESIA Phase. Specific mitigation measures will be proposed following the outcome of the risk assessment. — An emergency response plan must be compiled prior to construction and operation, which must include aspects such as

ASPECT	MITIGATION MEASURES
	appointment of emergency controller, provision of first aid, first responder contact numbers. — The company responsible for the facility at this stage is to have: — An emergency plan must be in place prior to commencement of construction. — Fuel spill containment procedures and equipment must be provided for and in place. — Hot-work permit and management system must be in place. — The necessary PPE must be provided and worn at the required working areas. — All necessary health controls/ practices must be in place, e.g. ventilation of welding and painting areas. — Fuels stored on site must be situated in dedicated, demarcated and bunded areas. — Suitable fire-fighting equipment must be available on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc

10.2 WIND ENERGY FACILITY

10.2.1 DRAFT ESIA IMPACT SIGNIFICANCE ASSESSMENT

This section provides an overview of the likely significance of construction phase (**Table 10-7**), operational phase (**Table 10-8**) and decommissioning phase (**Table 10-9**). This is used as a guide to determine whether additional assessment may be required in the ESIA phase. Impacts will be refined and assessed during the Final ESIA phase.

Table 10-7: 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 and Vibrations	Increase in construction noise levels	Negative	3	1	**Low**	**Yes**
Surface Water	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	
	Flooding	Negative	2	2	**Low**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
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**
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**	
Avifauna	Displacement due to disturbance during the Construction Phase	Negative	4	3	High	Yes
Bats	Loss of foraging habitat by clearing of vegetation	Negative	4	3	High	Yes
	Roost destruction during earthworks	Negative	4	3	High	
Aquatic Biodiversity	Direct loss of wetland habitat	Negative	4	4	**High**	**Yes**

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**	
	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**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
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 10-8: Potential Operational Phase Impacts

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
Noise and Vibrations	Noise Emissions	Negative	4	3	**High**	**Yes**
Surface Water	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	
	Flooding	Negative	2	2	**Low**	
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**	
	Reduced leachate from contaminated soils	Positive	3	2	**Medium**	
	Localised leachate from equipment	Negative	3	2	**Medium**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**
Avifauna	Displacement due to habitat loss	Negative	4	3	**High**	**Yes**
	Collisions Mortality on wind turbines	Negative	4	3	**High**	
Bats	Bat mortalities during foraging	Negative	4	3	**High**	**Yes**
	Bat mortalities during migration	Negative	4	3	**High**	
	Increased bat mortalities due to light attraction and habitat creation	Negative	4	3	**High**	
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**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
	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**
	Shadow Flicker	Negative	4	3	**High**	
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 10-9: 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 and Vibrations	Increase in construction noise levels	Negative	3	1	**Low**	**No**
Surface Water	Stormwater runoff	Negative	2	2	**Low**	**Yes**
	Erosion	Negative	4	2	**Medium**	
	Flooding	Negative	2	2	**Low**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
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**	
Terrestrial Biodiversity	Establishment and spread of AIS	Negative	3	2	**Medium**	**Yes**
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**	

ASPECT	IMPACT	NATURE	PROBABILITY	CONSEQUENCE	SIGNIFICANCE (BEFORE MITIGATION)	FURTHER ASSESSMENT REQUIRED
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**	

10.2.2 PROPOSED MITIGATION MEASURES

The possible mitigation measures that could be applied to the potential impacts identified in **Section 10.1.1** are shown in **Table 10-10**, **Table 10-11** and **Table 10-12.** These mitigation measures are preliminary and will be refined during the Final ESIA Phase where the specialists will undertake detailed impact assessments.

The Environmental, Health and Safety Guidelines for Wind Energy has been consulted in the development of these preliminary mitigation measures and will be used to further refine the mitigation measures.

Table 10-10 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 and Vibrations	— 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.

ASPECT	MITIGATION MEASURES

	— 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.
	— Implementation of standard construction phase mitigation measures to be outlined in the ESMP will assist in controlling noise emissions and minimising impacts.
	— The following measures are outlined by the IFC / WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control noise impacts:
	  — Operating turbines in reduced noise mode.
	  — Building walls/appropriate noise barriers around potentially affected buildings (only an option in hilly terrain, due to the height of turbines).
	  — Curtailing turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.
	— A noise modelling study will be carried out during the final ESIA Phase to evaluate the noise impacts on the nearby sensitive receptors and determine the optimal locations for the wind turbines.

Topography and Geology	— Implementation of erosion management measures in line with the Erosion Management Plan and Rehabilitation Plan to be included in the ESMP. — All cleared areas must be revegetated with indigenous vegetation. — Implement an effective stormwater runoff control system, including runoff control features to direct and dissipate water flow from roads and other hardened surfaces. — Progressive rehabilitation will be essential to reduce the potential for soil erosion and sedimentation.

ASPECT	MITIGATION MEASURES
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. — 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. — 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. — 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.
Groundwater	— 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.

ASPECT	MITIGATION MEASURES
	— 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.
Terrestrial Biodiversity	— The preferred project layout must avoid sensitive habitats as far as possible. — Minimise development footprint within high sensitivity areas and ensure that final development layout takes account of areas identified as sensitive during the field survey. Some avoidance and changes to the layout may be required if some areas with a high abundance of species of concern are shown to occur within the preferred development areas. — Sensitive faunal habitats such as drainage lines and wetlands must be avoided. — Detailed biodiversity assessment is required to determine sensitivity, quantify potential impacts to flora and fauna, and provide for recommendation of mitigation measures. — Alien and invasive vegetation control should take place throughout the duration of the construction and operation phases. An alien management plan must be part of the ESMP. — The main mitigation measures, other than required Management Plans for plant rescue, rehabilitation, and alien plant management, are related to infrastructure location, which is a planning phase measure. Specific recommendations will form part of the outcome of the ESIA.
Avifauna	— Construction activity should be restricted to the immediate footprint of the infrastructure as far as possible. — Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. — Measures to control noise and dust should be applied according to current best practice in the industry. — Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. — It is recommended that suitable pro-active mitigation be implemented at all turbines, which could include shut down on demand or other proven mitigation measures. — A raptor-friendly pole design must be used, and the pole design must be approved by the avifaunal specialist — All internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the Eskom standard. — The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts: — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility, such as water bodies, perching or nesting areas, novel feeding

ASPECT	MITIGATION MEASURES
	areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites. — Avoid attracting birds to predictable food sources, such as on-site or off-site waste disposal areas, or landfills; this is especially relevant when vultures or other carrion-eating birds are present. These types of mitigation measures may also need to be carried out in the surroundings of the wind energy facility in order to be effective. — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate
Bats	— Adhere to the sensitivity map criteria. Rehabilitate cleared vegetation where possible at areas such as laydown yards. — Turbine layout adjustments to adhere to the sensitivity map, and where needed, reducing blade movement at selected turbines during high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled. — Reducing blade movement at selected turbines if a migration route is discovered. Acoustic deterrents are developed well enough to be trialled. — Curtailment that increases cut-in speed. — Curtailment to prevent freewheeling — Acoustic bat deterrents (Investigated during the final ESIA phase) — Minimising light pollution on site — The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts: — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility,such as water bodies, perching or nesting areas, novel feeding areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites. — Consider adjustments of cut-in wind speeds to reduce potential bat collisions. The feasibility of this measure should be informed by species- and site-specific data. A slight increase in cut-in wind speed may have the potential to achieve significant reductions in bat fatalities, with minimal reduction in generation or financial returns. — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate

ASPECT	MITIGATION MEASURES
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. — 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.
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

ASPECT	MITIGATION MEASURES
	constructed, and a palaeontologist should be called in to determine proper mitigation measures. — Include a Chance and Find Procedure in EMSP
Visual	— Steep slopes should be avoided, erosion control measures, and revegetation procedures implemented. — 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. — Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. — Vegetation clearing should take place in a phased manner. — Make use of existing gravel access roads where possible. — Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible. — Ensure that dust suppression techniques are implemented: — on all access roads; — in all areas where vegetation clearing has taken place; — on all soil stockpiles. — Maintain a neat construction site by removing litter, rubble and waste materials regularly. — Restrict vegetation clearance on the site to that which is required for the correct operation of the facility. — As far as possible, limit the number of maintenance vehicles which are allowed to access the site. — Ensure that dust suppression techniques are implemented on all gravel access roads. — 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.
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

ASPECT	MITIGATION MEASURES

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

Table 10-11 Proposed Mitigation Measures for Operational Phase Impacts

ASPECT	MITIGATION MEASURES

Noise and Vibrations	— The following measures are outlined by the IFC / WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control noise impacts:
	  — Operating turbines in reduced noise mode.
	  — Building walls/appropriate noise barriers around potentially affected buildings (only an option in hilly terrain, due to the height of turbines).
	  — Curtailing turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.
	— A noise modelling study will be carried out during the final ESIA Phase to evaluate the noise impacts on the nearby sensitive receptors and determine the optimal locations for the wind turbines.

Surface Water	— 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.

ASPECT	MITIGATION MEASURES
Groundwater	— Redundant equipment must be demolished and removed to an appropriate waste facility. — 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	— Detailed biodiversity assessment is required to determine sensitivity, quantify potential impacts to flora and fauna, and provide for recommendation of mitigation measures. — Alien and invasive vegetation control should take place throughout the duration of the project. An alien management plan must be part of the ESMP. — The main mitigation measures, other than required Management Plans for plant rescue, rehabilitation, and alien plant management, are related to infrastructure location, which is a planning phase measure. Specific recommendations will form part of the outcome of the ESIA.

Avifauna	— It is recommended that suitable pro-active mitigation be implemented at all turbines, which could include shut down on demand or other proven mitigation measures.
	— A raptor-friendly pole design must be used, and the pole design must be approved by the avifaunal specialist
	— All internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the Eskom standard.
	— The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts:
	  — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility, such as water bodies, perching or nesting areas, novel feeding areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites.
	  — Avoid attracting birds to predictable food sources, such as on-site or off-site waste disposal areas, or landfills; this is especially relevant when vultures or other carrion-eating birds are present. These types of mitigation measures may also need to be carried out in the surroundings of the wind energy facility in order to be effective.
	  — Consider adjustments of cut-in wind speeds to reduce potential bat collisions. The feasibility of this measure should be informed by species- and site-specific data. A slight increase in cut-in wind speed may have the potential to achieve significant reductions in bat fatalities, with minimal reduction in generation or financial returns.
	  — Eliminate "free-wheeling" (free spinning of rotors under low wind conditions when turbines are not generating power).
	  — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate

ASPECT	MITIGATION MEASURES

Bats	— Reducing blade movement at selected turbines if a migration route is discovered. Acoustic deterrents are developed well enough to be trialled.
	— Curtailment that increases cut-in speed.
	— Curtailment to prevent freewheeling
	— Acoustic bat deterrents (Investigated during the final ESIA phase)
	— Minimising light pollution on site
	— The following measures are outlined by the WBG Wind Energy EHS Guideline (August 2015) as having potential to assist to prevent, minimize, and control impacts:
	  — Avoid artificially creating features in the environment that could attract birds and bats to the wind energy facility,such as water bodies, perching or nesting areas, novel feeding areas, and staging or roosting habitats. Capping or fixing any cavities in walls or buildings helps to remove potential bat roosting sites.
	  — Consider adjustments of cut-in wind speeds to reduce potential bat collisions. The feasibility of this measure should be informed by species- and site-specific data. A slight increase in cut-in wind speed may have the potential to achieve significant reductions in bat fatalities, with minimal reduction in generation or financial returns.
	  — Eliminate “free-wheeling” (free spinning of rotors under low wind conditions when turbines are not generating power).
	  — Assess the current state of the art of bird and bat deterrence technology, and consider implementing any proven effective technologies where appropriate

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.
Visual	— As far as possible, limit the number of maintenance vehicles which are allowed to access the site. — If economically and technically feasible, make use of motion detectors on security lighting. — A shadow flicker impact assessment for the wind turbines will be undertaken by the visual specialist during the Final ESIA based on expert judgement. Specific mitigation measures will be provided by the specialist hoewver the following should be considered: — The positions of the turbines should take into considertaion the orientation of the turbines relative to the nearby houses and the latitude of the site.

ASPECT	MITIGATION MEASURES
	— Consider planting a treeline along the boundary of each facility to obstruct shadows and prevent the effect of shadow flicker from impacting on surrounding residents.

Table 10-12 Proposed Mitigation Measures for Decomissioning Phase Impacts

ASPECT	MITIGATION MEASURES
Air Quality	— Information regarding construction and decommissioning 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 and Vibrations	— Planning construction and decommissioning 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.

ASPECT	MITIGATION MEASURES
	— Implementation of standard construction phase mitigation measures to be outlined in the ESMP will assist in controlling noise emissions and minimising impacts. — A noise modelling study will be carried out during the final ESIA Phase to evaluate the noise impacts on the nearby sensitive receptors and determine the optimal locations for the wind turbines.
Topography and Geology	— All cleared areas must be revegetated with indigenous vegetation. — Implement an effective stormwater runoff control system, including runoff control features to direct and dissipate water flow from roads and other hardened surfaces. — Progressive rehabilitation will be essential to reduce the potential for soil erosion and sedimentation.
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. — 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. — 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. — 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.
Groundwater	— 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. — 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).

ASPECT	MITIGATION MEASURES
	— 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.
Terrestrial Biodiversity	— Detailed biodiversity assessment is required to determine sensitivity, quantify potential impacts to flora and fauna, and provide for recommendation of mitigation measures. — Alien and invasive vegetation control should take place throughout the duration of the project. An alien management plan must be part of the ESMP. — The main mitigation measures, other than required Management Plans for plant rescue, rehabilitation, and alien plant management, are related to infrastructure location, which is a planning phase measure. Specific recommendations will form part of the outcome of the ESIA.
Avifauna	— Measures to control noise and dust should be applied according to current best practice in the industry.
Bats	— Rehabilitate cleared vegetation where possible at areas such as laydown yards.
Aquatic Biodiversity	— The extent of disturbance during decommissioning 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. — 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. — 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).

ASPECT	MITIGATION MEASURES
	— 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.

Visual	— Carefully plan to minimise the decommissioning period and avoid delays.
	— Position laydown areas and related storage/stockpile areas in unobtrusive positions in the landscape, where possible.
	— Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
	— Vegetation clearing should take place in a phased manner.
	— Make use of existing gravel access roads where possible.
	— Limit the number of vehicles and trucks travelling to and from the proposed sites, where possible.
	— Ensure that dust suppression techniques are implemented:
	  — on all access roads;
	  — in all areas where vegetation clearing has taken place;
	  — on all soil stockpiles.
	— Maintain a neat construction site by removing litter, rubble and waste materials regularly.
	— Restrict vegetation clearance on the site to that which is required for the correct operation of the facility.
	— As far as possible, limit the number of maintenance vehicles which are allowed to access the site.
	— Ensure that dust suppression techniques are implemented on all gravel access roads.

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/decommissioning in order for expectations to be managed appropriately. — Prioritisation of local labour through implementing contractor policies.

ASPECT	MITIGATION MEASURES

	— 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).

11 PLAN OF STUDY FOR THE ESIA

11.1 APPROACH

The Final ESIA phase will consist of the following tasks:

- Continuation of stakeholder engagement;
- Update of Specialist studies;
- Close knowledge gaps such as:
  - Identification of Species of Concern that may occur within the study area
  - Impacts on Avifauna within the study area
  - Impacts on Bats within the study area
- Assessment of the significance of potential impacts;
- Update of the ESIA Report and
- Preparation of the ESMP.

11.2 ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

The ESMP aims at defining and structuring the measures to be implemented in order to mitigate or optimize the project's potential impacts.

On a larger scale, the ESMP establishes responsibilities for the implementation and oversight of the proposed environmental and social management measures. Responsibilities are to be shared among several stakeholders, including the developer, contractors and coordinating units.

The ESMP also provides guidelines for a comprehensive monitoring plan which shall ensure, on an ongoing basis, the adequate implementation of the proposed environmental and social management measures. This Monitoring Plan will be based on a set of performance indicators and a clear formulation of expected results to be achieved or maintained. Thus, the Plan will facilitate ongoing adjustments to initial mitigation/optimization measures, within an adaptive management approach.

The ESMP will be developed for this project during the ESIA Phase as a separate document and will take into consideration ESS 1:

The ESMP is an instrument that details (a) the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental and social impacts, or to reduce them to acceptable levels; and (b) the actions needed to implement these measures.

11.3 IMPACT ASSESSMENT METHODOLOGY

The ESIA uses a methodological framework developed by WSP to meet the combined requirements of international best practice, WB ESF requirements and NEMA, Environmental Impact Assessment Regulations, 2014, as amended (GN No. 326) (the “EIA Regulations”).

As required by the EIA Regulations (2014) as amended, the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact;
- Significance of the Impact;
- Consequence of the Impact;

- Extent of the impact;
- Duration of the Impact;
- Probability if the impact;
- Degree to which the impact:
  - can be reversed;
  - may cause irreplaceable loss of resources; and
  - can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- Magnitude: to what extent environmental resources are going to be affected;
- Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

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 the ESIA.

The Final ESIA will also follow the methodologies outlined in Annexure 1 of ESS 1 with specific reference to:

- (a): Environmental and Social Impact Assessment (ESIA);
- (d): Cumulative Impact Assessment;
- (f): Environmental and Social Management Plan (ESMP); and
- Assessment of residual impacts

11.3.1 METHODOLOGY

Impacts are assessed in terms of the following criteria:

The nature; a description of what causes the effect, what will be affected and how it will be affected.

Table 11-1: Nature or Type of Impact

NATURE OR TYPE OF IMPACT	DEFINITION
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.

NATURE OR TYPE OF IMPACT	DEFINITION
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road or rail traffic resulting from the operation of Project).
Secondary	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

The physical extent:

Table 11-2: Physical Extent Rating of Impact

SCORE	DESCRIPTION
1	the impact will be limited to the site;
2	the impact will be limited to the local area;
3	the impact will be limited to the region;
4	the impact will be national; or
5	the impact will be international;

The duration, wherein it is indicated whether the lifetime of the impact will be:

Table 11-3: Duration Rating of Impact

SCORE	DESCRIPTION
1	of a very short duration (0 to 1 years)
2	of a short duration (2 to 5 years)
3	medium term (5–15 years)

4	long term (> 15 years)
5	permanent

Reversibility: An impact is either reversible or irreversible. A scale of the level of reversibility if an impact is How long before impacts on receptors cease to be evident.

Table 11-4: Reversibility of The Impact

SCORE	DESCRIPTION
1	The impact is immediately reversible.
3	The impact is reversible within 2 years after the cause or stress is removed; or
5	The activity will lead to an impact that is in all practical terms permanent.

The magnitude of impact on ecological processes, quantified on a scale from 0-10, where a score is assigned.

Table 11-5: Magnitude Rating of Impact

SCORE	DESCRIPTION
0	small and will have no effect on the environment.
1	minor and will not result in an impact on processes.
2	low and will cause a slight impact on processes.
3	moderate and will result in processes continuing but in a modified way.
4	high (processes are altered to the extent that they temporarily cease).
5	very high and results in complete destruction of patterns and permanent cessation of processes.

The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:

Table 11-6: Probability Rating of Impact

SCORE	DESCRIPTION
1	very improbable (probably will not happen.
2	improbable (some possibility, but low likelihood).
3	probable (distinct possibility).

4	highly probable (most likely).
5	definite (impact will occur regardless of any prevention measures).

The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;

The status, which is described as either positive, negative or neutral;

The degree to which the impact can be reversed;

The degree to which the impact may cause irreplaceable loss of resources; and

The degree to which the impact can be mitigated.

The significance is determined by combining the above criteria in the following formula:

Significance = (Extent + Duration + Reversibility + Magnitude) x Probability

[S=(E+D+R+M) ×P]

Where the symbols are as follows:

SYMBOL	CRITERIA	DESCRIPTION
S	Significance Weighting	
E	Extent	Refer to Table 11-2
D	Duration	Refer to Table 11-3
M	Magnitude	Refer to Table 11-5
P	Probability	Refer to Table 11-6

The significance weightings for each potential impact are as follows:

OVERALL SCORE	SIGNIFICANCE RATING (NEGATIVE)	SIGNIFICANCE RATING (POSITIVE)	DESCRIPTION
< 30 points	Low	Low	where this impact would not have a direct influence on the decision to develop in the area
31 – 60 points	Medium	Medium	where the impact could influence the decision to develop in the area unless it is effectively mitigated
> 60 points	High	High	where the impact must have an influence on the decision process to develop in the area

11.4 DESCRIPTION OF ALTERNATIVES

There are 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 7** of this report. The Detailed Level Alternatives will be addressed within the Final ESIA Report.

11.5 SPECIALIST STUDIES TO BE UNDERTAKEN

The following specialist assessments have been commissioned for the Final ESIA Phase:

- Surface Water Impact Assessment;
- Groundwater Impact Assessment;
- Soil Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Heritage Impact Assessment;
- Palaeontological Impact Assessment;
- Visual Impact Assessment;
- Traffic Impact Assessment;
- Social Impact Assessment;
- Environmental Acoustic Impact Assessment;
- Avifauna Assessment (specifically for wind); and
- Bat Impact Assessment (specifically for wind).

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, as well as the requirements in the WB ESS

A detailed land contamination study will be undertaken for the decommissioning project (Component A), of which the findings will be integrated into the Final ESIA.

11.5.1 SURFACE WATER IMPACT ASSESSMENT

The preliminary surface water study will be updated during the Final ESIA phase to 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.

No surface water samples will be collected as existing surface water quality sampling data for the Komati Power Station as per the surface water monitoring points identified in the WUL will be used to update the surface water impacts during the ESIA.

11.5.2 GROUNDWATER IMPACT ASSESSMENT

The preliminary groundwater study will be updated during the Final ESIA phase to include the following:

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

No additional sampling will be undertaken for the groundwater assessment. The Component A contaminated land study initiated by Nemai Consulting during the Final ESIA Phase will include additional sampling to close any knowledge gaps and will be used to update and refine the groundwater impacts to component B.

11.5.3 SOIL AND LAND CAPABILITY IMPACT ASSESSMENT

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

This study is related to Soil and Land Capability Potential. No additional sampling (soil or groundwater) is required.

11.5.4 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

A detailed Terrestrial Biodiversity Assessment will be undertaken during the Final ESIA phase. This will be underataken in-line with ESS 6 and will include 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).

11.5.5 AQUATIC BIODIVERSITY IMPACT ASSESSMENT

A detailed Aquatic Biodiversity Assessment will be undertaken during the Final ESIA phase. This will be undertakne in line with ESS 6 and will include 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 and ESS 6-prescribed methods.
- Finalised mitigation measures for inclusion in the Project ESMP.

11.5.6 HERITAGE AND PALAEONTOLOGICAL IMPACT ASSESSMENT

The 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 ESIA 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 ESIA 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 ESMP.

11.5.7 VISUAL IMPACT ASSESSMENT

A detailed Visual Impact Assessment will be undertaken during the Final ESIA 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;
- Undertake a shadow flicker impact assessment for the wind turbines based on expert judgement based on previous assessments the specialist has conducted. No shadow flicker modelling will be conducted for the project;
- Assessment of mitigation measures;
- A review of the findings of the visual impact assessment 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.

11.5.8 SOCIAL IMPACT ASSESSMENT

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

- Following the approval of the 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.

11.5.9 TRAFFIC IMPACT ASSESSMENT

The Traffic Impact Assessment will be updated during the Final ESIA 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 ESMP.

11.5.10 ACOUSTIC IMPACT ASSESSMENT

An acoustic specialist study for the proposed WEF will be undertaken as part of the Final ESIA phase will comprise the following:

PRELIMINARY MODELLING

A preliminary modelling exercise will be carried out using a simple model which assumes hemispherical propagation of noise from each turbine. Such modelling will focus on receptors located within a 2 km radius of the turbines.

If the preliminary model suggests that turbine noise at all sensitive receptors is likely to be below an LA90 level of 35 dB(A) at a wind speed of 10 m/s at 10 m height during day and night times, then this preliminary modelling is likely to be sufficient to assess noise impact of the proposed project. If LA90 levels at any receptor location are above 35 dB(A) then a more detailed acoustic study will need to be carried out which includes comprehensive baseline monitoring. Alternatively input into micro-siting of the turbines will be provided to avoid unwanted impacts or further detailed studies.

ENVIRONMENTAL ACOUSTIC IMPACT ASSESSMENT REPORT

A detailed Environmental Acoustic Impact Assessment report will be provided detailing findings of the preliminary modelling, associated impacts, any inputs into micro-siting, as well as detailed recommendations, including mitigation measures if deemed necessary.

11.5.11 AVIFAUNA ASSESSMENT

An Avifaunal Assessment will be undertaken during the Final ESIA Phase and will include the following:

- The implementation of four avifaunal surveys (12 month pre-construction monitoring for the WEF), utilising transects, vantage point watches, focal points and incidental counts, to inform the assessment of the potential impacts of the planned infrastructure within the development footprint. The monitoring protocol is guided by the following:
  - Procedures for the Assessment and Minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA when applying for Environmental Authorisation (Gazetted October 2020)
  - Protocol for the specialist assessment and minimum report content requirements for environmental impacts om avifaunal species by onshore wind energy generation facilities where the electricity output is 20MW or more (Government Gazette No. 43110 – 20 March 2020).
  - Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Anderson, M.D., & A.H. Smit. 2015. Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa. Produced by the Wildlife & Energy Programme of the Endangered Wildlife Trust & BirdLife South Africa. Hereafter referred to as the wind guidelines.
  - The Environmental, Health and Safety Guidelines for Wind Energy
- The avifaunal specialists report will be structured around the following terms of reference:
  - Description of the affected environment from an avifaunal perspective.
  - Discussion of gaps in baseline data and other limitations.
  - Description of the methodology that was used for the field surveys.
  - Comparison of the site sensitivity recorded in the field with the sensitivity classification in the DFFE National Screening Tool and adjustment if necessary.
  - Provision of an overview of all applicable legislation.
  - Provision of an overview of assessment methodology.
  - Identification and assessment of the potential impacts of the proposed development on avifauna including cumulative impacts.
  - Provision of sufficient mitigation measures to include in the Environmental Management Programme (ESMP).
  - Conclusion with an impact statement whether the facility is fatally flawed or may be authorised.

— For each anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project ESMP.

11.5.12 BAT IMPACT ASSESSMENT

The following is proposed for the Final ESIA Phase:

— 12 Months of pre-construction bat monitoring to inform the Final ESIA phase for the WEF;
— Confirmation of sensitivities impacts and mitigation measures;
— Study bat species assemblage and abundance on the site;
— Study temporal distribution of bat activity across the night as well as the four seasons of the year in order to detect peaks and troughs in activity;
— Determine whether weather variables (wind, temperature, humidity and barometric pressure) influence bat activity;
— Determine the weather range in which bats are mostly active;
— Develop long-term baseline data for use during operational monitoring;
— Identify which turbines need to have special attention with regards to bat monitoring during the operational phase and identify if any turbines occur in sensitive areas and need to be shifted into less sensitive areas or removed from the layout; and
— Detail the types of mitigation measures that are possible (in-line with the Environmental, Health and Safety Guidelines for Wind Energy) if bat mortality rates are found to be unacceptable, including the potential times/ circumstances, which may result in high mortality rates.

11.6 STAKEHOLDER ENGAGEMENT

The stakeholder engagement process for this ESIA has been designed around GNR 326 of EIA Regulations, while taking into consideration the WB's Environmental and Social Standards on Stakeholder Engagement and Information Disclosure (ESS10).

Public Participation activities to be undertaken during the ESIA phase is summarised in **Table 11-7**.

It must be noted that this report (Draft ESIA) will not go out for public review; however a Scoping Report (in line with NEMA requirements) will be compiled based on this report which will be available for public review. The EIA Report (as per NEMA requirements), will be aligned with the final ESIA and will be made available for public review. Where possible, WSP will align with Nemai Consulting (Component A) on stakeholder engagement to reduce stakeholder fatigue.

Table 11-7: Public Participation Activities during ESIA

ACTIVITY	DETAILS	PRELIMINARY DATES
Maintenance of I&AP Register	— I&APs with a potential interest in the project will be identified at the outset of the project. — The I&AP database will be compiled to include all affected landowners and occupiers, adjacent landowners and occupiers, I&APs that formally registered during the previous EIA process, relevant authorities. As noted above, the existing database for Komati Power Station will be used as the basis of the register for this process.	Throughout the project

ACTIVITY	DETAILS	PRELIMINARY DATES
	— All I&APs on the database will be notified of the project via email and SMS. The email and SMS will invite them to participate in the process and will inform them of the public review period of the draft Reports. All I&APs identified will be registered on the project database, and the database will be maintained throughout the process.	
Notifications	WSP will notify stakeholders via site notices, newspaper adverts, mail, email, and/or SMS on developments of the project. Where possible, WSP will liase with Nemai Consulting on the coordination of the notifications.	Throughout the project
Public Meetings	WSP with liase with Nemai Consulting to coordiante Public Meetings that talk to the Decomissioning (being undertaken by Nemai) and Renewable projects.	During the Final ESIA Phase: January 2023
Public Review of Reports	All stakeholders will be notified of the availability of the Draft Reports, 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: — Komati Power Station Entrance — Komati Paypoint and Library; — Gerard Sekoto Library; — Eastdene Public Library; and — Hendrina Public Library. — The document will be made available to download from the WSP website; and — Copies of CDs will be made available on request.	— Draft Scoping Report Review: October 2022 — Draft EIA Report Review: January 2023
Maintaining Comments and Responses Report	All comments received during the ESIA phase will be recorded in the comments and response report (CRR), which will be included in the draft and final ESIA Reports. The final ESIA Report will incorporate public comment received on the Draft ESIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.	Throughout the project

ACTIVITY	DETAILS	PRELIMINARY DATES
Stakeholder Notification	All stakeholders will receive a letter notifying them of the authority's decision	July 2023

In addition to the stakeholder engagement being undertaken by WSP in reference to this project, Urban-Econ will continue with implementing their SEP to engage with the stakeholders. Where possible, WSP will engage with stakeholders alongside Urban-Econ. As detailed in Urban-Econ's SEP, the following engagement methods with stakeholders as proposed:

- E-JETP Platform;
- Business Unit Form;
- Central Consultative Forum;
- Community WhatsApp group;
- Division Management Committees;
- Email;
- Formal letter;
- Generation National Group Forum;
- Grievance Redress Mechanism;
- Grievance logs;
- Interviews;
- JET Steerco;
- Local news media;
- Mass media;
- Monthly newsletter;
- One-on-one meetings;
- Pamphlets/leaflets/informative Articles;
- Press release;
- Press trips; and
- Regional media.

Further detail on how the above methods will be carried out is indicated in Urban-Econ's SEP (June, 2022).

12 CONCLUSION AND WAY FORWARD

Several Eskom power stations are reaching their 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 will reach its end-of-life expectancy in September 2022 when Unit 9 will have reached its DSD.

Eskom has developed an 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. The shutdown and dismantling of Komati Power Station (Component A) will immediately result in a reduced environmental footprint and GHG Emissions, ensure that dismantling is carried out in a responsible manner and include opportunities for repurposing some of the existing infrastructure.

Component B (This project) 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 Solar PV energy facility (an additional 50MW PV on the ashing facility in Phase II to be confirmed following decommissioning and rehabilitation activities), as well as a 150MW BESS facilities, and a WEF which will include the installation of approximately 7 turbines with a total of up to 70 MW generating capacity.

Component C is centred around three key pillars: (a) Transition support for Komati Permanent Workers, Suppliers and Contract Workers; (b) Community Development; and (c) Stakeholder engagement.

A Draft ESIA was compiled by WSP for the repurposing the Komati Power Station Complex with renewables. The overall objective of this Draft ESIA is to provide sufficient information to understand the status quo of the biophysical and social environments and preliminary identify potential impacts for further assessment. This was undertaken through consideration of the proposed project components, identification of the sources of potential impacts and subsequent provision of mitigation measures.

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 as far possible.

Considering the findings of the preliminary specialist studies and impact assessment, no fatal flaws were identified for the proposed Project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the environmental aspects is expected to be low. However, a number of specialist studies require a more detailed investigation to this status. This will be undertaken during the Final ESIA Phase, which will also include the following:

- Continuation of stakeholder engagement;
- Update of Specialist studies;
- Close knowledge gaps such as:
  - Identification of Species of Concern that may occur within the study area
  - Impacts on Avifauna within the study area
  - Impacts on Bats within the study area
- Assessment of the significance of potential impacts;
- Update of the ESIA Report and
- Preparation of the ESMP.

The Final ESIA is expected to be completed in February 2023.

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