



BASIC ASSESSMENT PROCESS

for

THE PROPOSED ESTABLISHMENT OF 2 X 20MVA 132/22KV NKAMBENI SUBSTATION AT MAHUSHU VILLAGE, MBOMBELA LOCAL MUNICIPALITY, EHLANZENI DISTRICT, MPUMALANGA PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Public Review Period:

10 May 2023– 12 June 2023

COMPILED BY:

Envirolution Consulting (Pty) Ltd
PO Box 1898
Sunninghill
2157
Tel: (0861) 44 44 99
Fax: (0861) 62 62 22
E-mail: info@envirolution.co.za
Website: www.envirolution.co.za

PREPARED FOR:

Eskom Holdings SOC Ltd
Mbombela Operating Unit
28 Ferreira Street,
Orion Building, Mbombela, 1200

COPYRIGHT WARNING

With very few exceptions the copyright of all text and presented information is the exclusive property of Envirolution Consulting (Pty) Ltd. It is a criminal offence to reproduce and/or use, without written consent, any information, technical procedure and/or technique contained in this document. Criminal and civil proceedings will be taken as a matter of strict routine against any person and/or institution infringing the copyright of Envirolution Consulting (Pty) Ltd

PROJECT DETAILS

Report Title	:	Basic Assessment Report
Report Status	:	Draft
Review Period	:	10 May 2023 – 12 June 2023
Project Title	:	The proposed establishment of 2 X 20MVA 132/22kV Nkambeni Substation at Mahushu village, Mbombela Local Municipality, Ehlanzeni District, Mpumalanga Province
Applicant	:	Eskom Holdings SOC Ltd
Environmental Consultant	:	Envirovolution Consulting (Pty) Ltd
DFFE Reference No.:	:	New Application

PREPARED BY:



Nombuso van Wyk
(EAPASA registered EAP)

REVIEWED BY:



Karthigesan Govender
(Pr.Sci.Nat. No: 400049/12)

TABLE OF CONTENTS

PROJECT DETAILS	i
LIST OF FIGURES	v
LIST OF TABLES	vi
ABBREVIATIONS	vii
1. BAR PROCESS APPROACH	viii
1.1 Details of the Applicant	viii
1.2 Environmental Assessment Practitioner (EAP)'s Details	viii
1.3 Qualifications and Experience of the EAP	viii
1.4 Details of the Independent Specialist Team	ix
1.5 Requirement and Purpose of Basic Assessment	ix
1.6 Objectives of the Basic Assessment Process	x
1.7 Pre-Application Authority Consultation and Notification	x
1.8 Application for Environmental Authorisation	x
2. INTRODUCTION	1
2.1 Project Background	1
3. PROJECT DESCRIPTION	2
3.1 Project Description	2
3.2 The infrastructure and key components considered as part of this Basic Assessment process includes:	2
3.3 Locality of study site	6
4. ALTERNATIVES	9
4.1 Feasible and Reasonable Project Alternatives	9
4.2 Site Specific Alternatives	9
5. GOVERNANCE FRAMEWORK AND ENVIRONMENTAL PROCESS	12
5.1 Listed Activities for Basic Assessment Process	12
5.2 Legislation and Guidelines that have informed the preparation of this EIA Report	14
6 PUBLIC PARTICIPATION PROCESS	25
6.1 Aim of the Public Participation Process	25
6.2 The following activities will take place during the public participation process:	25
7 DESCRIPTION OF THE AFFECTED ENVIRONMENT	28
7.1 Screening Report	28
7.2 Reasons for exclusion of the following identified specialist study:	29
7.2.1 Agricultural Potential, Land use and Capability	29
7.2.2 Civil Aviation Assessment:	32
7.3 Biophysical Characteristics of the site and surrounds	33
7.3.1 Topography	33

7.3.2 Climate	33
7.3.3 Geology	34
7.3.4 Soils	34
7.3.5 Hydrological Setting	34
7.3.6 Wetlands	36
7.3.7 Regional Vegetation	41
7.3.8 Terrestrial Flora	43
7.3.9 Habitat Survey and Site Ecological Importance	44
7.3.10 Terrestrial Fauna	45
7.3.11 Avifauna	45
7.3.12 Terrestrial Biodiversity	46
7.3.13 Ecosystem Threat Status	48
7.3.14 Ecosystem Protection Level	48
7.3.15 Protected Areas	49
7.3.16 National Protected Area Expansion Strategy	51
7.3.17 Mpumalanga Biodiversity Sector Plan	52
7.3.18 Important Bird and Biodiversity Area	52
7.4 Human and cultural Environment	54
7.4.1 Heritage Features	54
7.4.2 Palaeontological Sensitivity	55
7.5 Socio-Economic Features	56
7.5.1 Municipal Regional Setting	56
7.5.2 Unemployment profile	57
7.5.3 Socio-economic profile	57
7.5.3 Educational Profile	58
8. ENVIRONMENTAL IMPACT ASSESSMENT	59
8.1 Impact Assessment Methodology	59
8.2 No-Go Alternative	93
8.3 Cumulative impacts	97
9 CONCLUSIONS AND RECOMMENDATIONS	98

9.1 Summaries of Specialist findings	98
9.1.1 Terrestrial Ecology	98
9.1.2 Wetland Assessment	98
9.1.3 Heritage Impact Assessment	99
9.1.5 Palaeontological Impact Assessment	99
9.2 Impact Summary of the alternatives	99
9.3 Conclusion (Impact Statement)	103
9.4 Recommendations	104
10 APPENDICES	106

The following appendixes are attached:

Appendix A: Site plan(s)

- Appendix A1: Locality Maps
- Appendix A2: Sensitivity Maps

Appendix B: Site Photographs

Appendix C: Facility Illustrations

Appendix D: Specialist Studies

- Appendix D1: Terrestrial Biodiversity Compliance Statement and Water Resource Assessment
- Appendix D2: Heritage Impact Assessment
- Appendix D3: Palaeontological Site Verification

Appendix E: Public Participation Process

- Appendix E1: Site Notices
- Appendix E2: Newspaper Advertisement
- Appendix E3: Written notifications
- Appendix E4: Authority Consultation
- Appendix E5: Comments on the Draft BA Report
- Appendix E6: Minutes of meetings
- Appendix E7: Comment & Response Report
- Appendix E8: I&APs Database

Appendix F: Generic Environmental Management Programme (EMPr)

Appendix G: Other Information

- Appendix G1 – Basic Assessment Report (2016)
- Appendix G2 – Existing Environmental Authorization
- Appendix G3-Part 2 amendment Report
- Appendix G4 – Amended Environmental Authorization
- Appendix G5- Screening Report
- Appendix G6- Details of EAP (and expertise) and Affirmation

LIST OF FIGURES

FIGURE 1: GENERIC BASIC ASSESSMENT PROCESS.....	XI
FIGURE 2: LOCALITY MAP	7
FIGURE 3: NKAMBENI SUBSTATION DESIGN LAYOUT	8
FIGURE 4: MAP ILLUSTRATING THE INITIAL AUTHORISED SITE(S1) AND THE AMENDED EXTENDED SITE(S2).....	10
FIGURE 5: HISTORICAL IMAGE OF JUNE 2004	30
FIGURE 6: HISTORICAL IMAGE OF OCTOBER 2014	30
FIGURE 7: HISTORICAL IMAGE OF SEPTEMBER 2016.....	31
FIGURE 8: LAND COVER OF THE PROPOSED SITE	31
FIGURE 9: CIVIL AVIATION SENSITIVITY <i>SENSITIVITY MAP, NATIONAL SCREENING TOOL, 24 JAN 2023</i>	32
FIGURE 10: SITE DEPICTED IN THE RED CIRCLE	32
FIGURE 11: CONTOUR MAP	33
FIGURE 12: SOIL TYPES MAP	34
FIGURE 13: ECOSYSTEM THREAT STATUS OF RIVERS AND WETLAND ECOSYSTEMS IN THE PROJECT AREA	35
FIGURE 14: THE PROJECT AREA IN RELATION TO THE NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS.....	35
FIGURE 15: DIFFERENT WETLANDS FOUND WITHIN THE PROJECT AREA.....	36
FIGURE 16: DELINEATION OF ALL THE WETLANDS HGM UNITS LOCATED THROUGHOUT THE 500 M REGULATED AREA	37
FIGURE 17: AVERAGE ECOSYSTEM SERVICE SCORES FOR THE DELINEATED WETLAND SYSTEMS.....	38
FIGURE 18: OVERALL PRESENT ECOLOGICAL STATE OF DELINEATED WETLANDS	39
FIGURE 19: PROPOSED WETLAND BUFFERS FOR THE SUBSTATION	40
FIGURE 20: LOCATION OF THE WETLAND TO BE LOST WITHIN THE PROJECT AREA.	41
FIGURE 21: MAP ILLUSTRATING THE VEGETATION TYPE ASSOCIATED WITH THE PROJECT AREA.	41
FIGURE 22: THE DEGRADED BUSHVELD HABITAT ASSOCIATED WITH THE PROJECT AREA.....	43
FIGURE 23: MAP ILLUSTRATING THE SITE ECOLOGICAL IMPORTANCE OF THE PROJECT AREA	44
FIGURE 24: BIODIVERSITY SENSITIVITY OF THE PROJECT AREA ACCORDING TO THE SCREENING REPORT	47
FIGURE 25: MAP ILLUSTRATING THE ECOSYSTEM THREAT STATUS ASSOCIATED WITH THE PROJECT AREA	48
FIGURE 26: MAP ILLUSTRATING THE ECOSYSTEM PROTECTION LEVEL ASSOCIATED WITH THE PROJECT AREA.....	49
FIGURE 27: THE PROJECT AREA IN RELATION TO THE NEAREST PROTECTED AREAS	49
FIGURE 28: THE PROJECT AREA IN RELATION TO THE MPUMALANGA PROTECTED AREAS EXPANSION STRATEGY AREAS	50
FIGURE 29: THE PROJECT AREA IN RELATION TO THE NATIONAL PROTECTED AREA EXPANSION STRATEGY	51
FIGURE 30: THE PROJECT AREA IN RELATION TO THE MPUMALANGA BIODIVERSITY SECTOR PLAN FEATURES	52
FIGURE 31: THE PROJECT AREA IN RELATION TO THE KRUGER NATIONAL PARK IBA	53
FIGURE 32: LOCATION OF KNOWN HERITAGE SITES AND FEATURES IN RELATION TO THE PROJECT AREA	54
FIGURE 33: POTTERY, METAL, PORCELAIN AND GLASS AT THE PROPOSED SITE	55
FIGURE 34: THE STONE CAIRN AT THE PROPOSED SITE	55
FIGURE 35: REGIONAL SETTING.....	56
FIGURE 36: EMPLOYMENT BY INDUSTRY (2015 AND 2020).....	58

LIST OF TABLES

TABLE 1: APPLICANT DETAILS	VIII
TABLE 2: ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)'S DETAILS.....	VIII
TABLE 3: COORDINATES AND PROPERTY DETAILS.....	6
TABLE 4: LISTED ACTIVITIES	12
TABLE 5: APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES.....	14
TABLE 6: ENVIRONMENTAL SENSITIVITIES IDENTIFIED	28
TABLE 7: SPECIALIST ASSESSMENTS IDENTIFIED BY THE SCREENING TOOL.....	28
TABLE 8: SITE ECOLOGICAL IMPORTANCE ASSESSMENT SUMMARY	44
TABLE 9: THE FAUNA SPECIES RECORDED DURING THE FIELD SURVEY	45
TABLE 10: LIST OF BIRD SPECIES OF REGIONAL OR GLOBAL CONSERVATION IMPORTANCE THAT ARE EXPECTED TO OCCUR IN CLOSE VICINITY TO THE PROJECT AREA.....	46
TABLE 11: UNEMPLOYMENT RATES FROM 2015 TO 2019.....	57
TABLE 12: CONSTRUCTION PHASE IMPACTS	61
TABLE 13: OPERATIONAL PHASE IMPACTS.....	76
TABLE 14: SUMMARY OF THE NO-GO ALTERNATIVES.....	93
TABLE 15: CONSTRUCTION AND OPERATIONAL PHASE IMPACTS	100

ABBREVIATIONS

BAR	Basic Assessment Report
DBAR	Draft Basic Assessment Report
DARDLEA	Department of Agriculture, Rural Development and Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EDM	Ehlanzeni District Municipality
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
LILO	Loop In Loop Out
MLM	Mbombela Local Municipality
MPHRA	Mpumalanga Provincial Heritage Resources Authority
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NEMBA	National Environmental Management: Biodiversity Act (No. 10 of 2004)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SOC	State Owned Company
SWMP	Stormwater Management Plan
TOPS	Threatened or Protected Species
WMA	Water Management Area
WULA	Water Use License Application

1. BAR PROCESS APPROACH

1.1 Details of the Applicant

The applicant for the project is Eskom Holdings SOC Ltd. Details are provided in Table 1 below.

Table 1: Applicant Details

Name of applicant:	Eskom Holdings SOC Ltd
Applicant representative:	Mr. Josiah Zungu
Position:	Environmental Management Officer
Contact number/s:	+27 13 755 9655
Physical address:	Mbombela Operating Unit 28 Ferreira Street, Orion Building, Mbombela, 1200
E-mail:	ZunguJ@eskom.co.za.

1.2 Environmental Assessment Practitioner (EAP)'s Details

The details of the BA process project team that were involved in the preparation of this BAR are provided in Table 2. It should be noted that Envirolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to Eskom Holdings SOC Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Table 2: Environmental Assessment Practitioner (EAP)'s Details

Environmental Assessment Practitioner (EAP):	Octavia Nombuso van Wyk		
Contact person:	Nombuso van Wyk		
Postal address:	PO Box 1898, Sunninghill		
Postal code:	2157	Cell:	
Telephone:	087 898 5000		083 419 8905
E-mail:	nombuso@envirolution.co.za	Fax:	(086) 162 62 22
EAP Qualifications	Hons Environmental Management		
EAP Registrations/ Associations	Environmental Assessment Practitioners Association of South Africa (No: 2019/8613)		

1.3 Qualifications and Experience of the EAP

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix G6** for CVs):

Nombuso van Wyk– The Environmental Assessment Practitioner (EAP) for this project holds an Hons degree in Environmental Management with 5 years of experience in the consulting field and is EAPASA registered. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public

participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.

Karthigesan Govender – The Project Manager for this project is a registered Professional Natural Scientist and holds an Honours Degree in Botany. He has over 20 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIAs for several diverse projects across the country.

1.4 Details of the Independent Specialist Team

The specialist studies undertaken for this application are outlined below and are attached within **Appendix E**.

Name of Specialist	Title of specialist report/ s as attached in Appendix E	Name	Date issued
The Biodiversity Company	Terrestrial Ecology Assessment	Carami Burger	January 2023
The Biodiversity Company	Wetland Assessment and Delineation	Rowan Buhrmann	January 2023
Apelser Archaeological Consulting	Phase 1 Cultural Heritage Impact Assessment (Update)	A.J. Pelsner	November 2022

1.5 Requirement and Purpose of Basic Assessment

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as “listed activities”. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant Environmental Authorisation. Eskom Holdings SOC Ltd requires an Environmental Authorisation for this project in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and listing notices GNR 327, 325 and 324 of the Environmental Impact Assessment Regulations, 2014 as amended in 07 April 2017 (GNR 326); a Basic Assessment (BA) Process is thus required for this project.

An Environmental Impact Assessment is an effective planning and decision-making tool as it provides the opportunity for the applicant to be forewarned of potential environmental issues and assess if potential environmental impacts need to be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process includes certain feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided to an acceptable level as confirmed by the Environmental Assessment Practitioner (EAP). Comprehensive, independent environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the EAP of its comprehensive

recommendation and provide the Competent Authority with sufficient information in order to make an informed decision. The Department of Forestry, Fisheries and the Environment (DFFE) is the Competent Authority. Eskom Holdings SOC Ltd has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the Basic Assessment process and compile the Basic Assessment Report (BAR) and associated Generic Environmental Management Programme (EMPr).

1.6 Objectives of the Basic Assessment Process

According to Appendix 1 of the EIA Regulations of 2014 (GNR 326), the objective of the basic assessment process is to, through a consultative process –

- a. determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b. identify the alternatives considered, including the activity, location, and technology alternatives;
- c. describe the need and desirability of the proposed alternatives;
- d. through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and alternatives on these aspects to determine –
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts –
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated; and
- (a) through a ranking of the site sensitivities and possible impacts the activity and alternatives will impose on the sites and location identified through the life of the activity to –
 - (i) identify and motivate a preferred site, activity and alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

The main objective of the BAR and the Generic EMPr is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures.

1.7 Pre-Application Authority Consultation and Notification

Envirolution Consulting submitted a pre-application request form, the form provided the DFFE with an overview and the legislative requirements and approach to BA process of the proposed project. The DFFE provided a response to the pre-application meeting request on Friday 27/ 01/ 2023, allocated the preapplication meeting to a case officer (namely Mr Jay Jay) and subsequently assigned the following reference number: **2023-01-0032 (Appendix E4)**

It should be noted that a pre-application meeting with the DFFE was, however, not deemed necessary by the allocated case officer, since he advised it's a straight forward project.

1.8 Application for Environmental Authorisation

An 'Application Form for Environmental Authorisation' is being submitted to the DFFE at the same time as making this draft version of the BAR available for review and comment. Public Participation activities to be completed in

support of the application for EA for the proposed project are outlined in **Section 6** of the BAR. The timeline associated with a BA process and a general summary of the activities which will be undertaken as part of the BA process are provided in the image below:

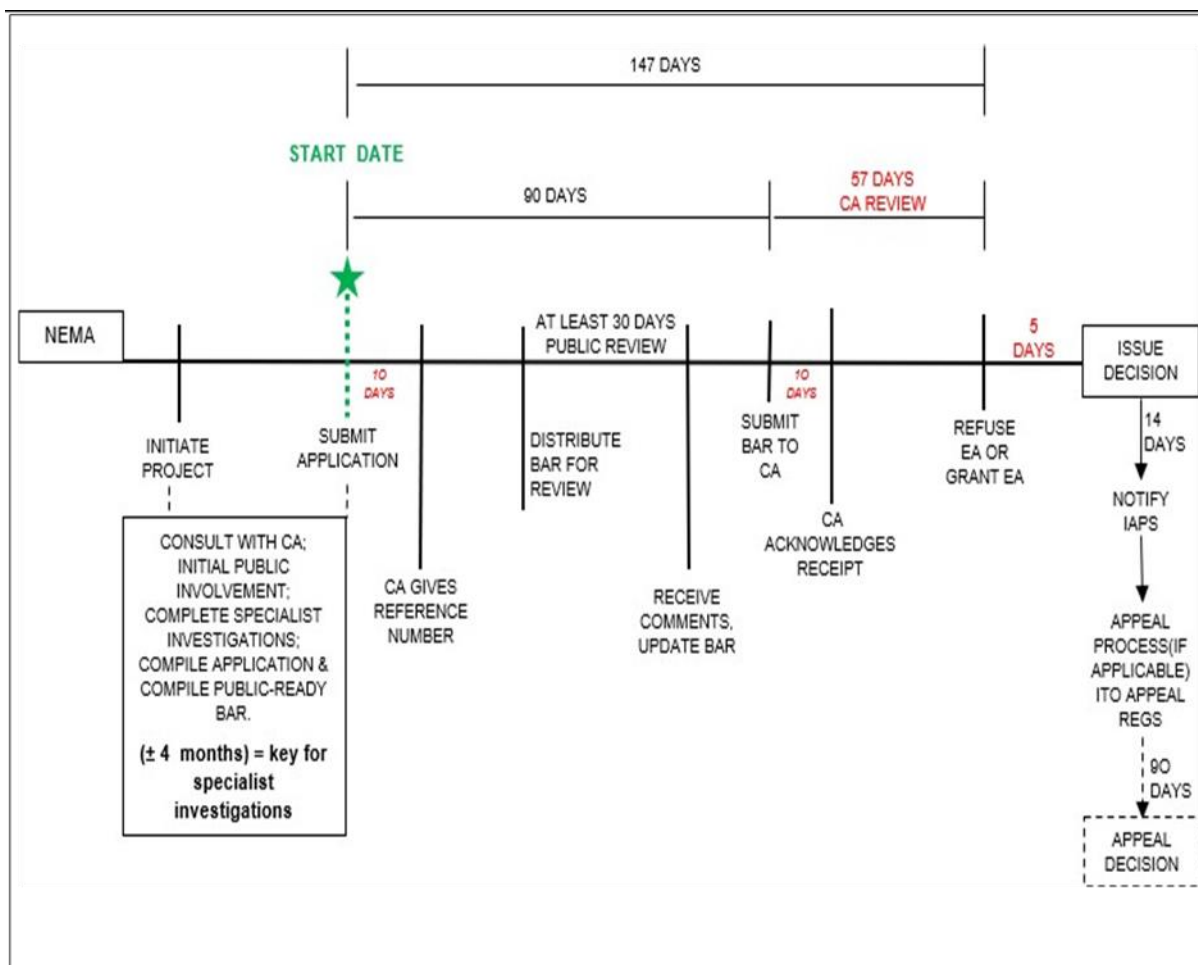


Figure 1: Generic Basic Assessment Process

2. INTRODUCTION

2.1 Project Background

Envirovolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited (hereafter referred to as Eskom) to conduct the Basic Assessment (BA) Process for the proposed development of the Nkambeni 2 X 20MVA 132/22kV Substation and the associated Loop In Loop Out (LILO) which connects to the existing powerline in Kiepersol, City of Mbombela Local Municipality, Ehlanzeni District Municipality, Mpumalanga Province.

Eskom Holdings is the biggest producer of electricity in South Africa and is a vertically integrated company licensed to generate, transmit and distribute electricity. A distribution operation constructs and maintains equipment that transforms the power supply to the type that meets the customer's needs. Reliable network performance targets necessitate that Eskom Distribution improves present distribution network performance levels.

The substation is required since Eskom will be upgrading an existing 66kv line to a 132 kV line. The line will run from the substation area to the existing Kiepersol substation in Hazyview with the aim to improve the energy sector to meet the increased current and future demands of electricity in the area. The proposed development will also reduce black outs in the area through the back feed system that will be brought about by the erection of the new substation.

Other Authorizations

Eskom received an Environmental Authorisation (EA DEA Reference: 14/12/16/3/3/1/1603), approved 28 October 2016 and authorised the construction of a 2 x 20 MVA 132/22kV substation and 20 m 132 loop in and loop out lines of an extent of approximately 150 m x 150 m on the Remaining Extent of the farm Nkambeni 950 JU (the then Preferred Site Alternative S1). Three more site alternatives were assessed during the application of that EA (Refer to **Appendix G1** for the Basic Assessment Report submitted in 2016 and **Appendix G2** for the Environmental Authorisation issued on the 28th October 2016).

In 2018, an application was made to amend the EA to authorise the then Site Alternative S2 (now proposed site) considering that the Tribal Authority did not condone the construction of the substation on the authorised Site 1. Due to the existence of possible heritage sites on the Site Alternative 2, Eskom also proposed to extend the area allocated for Alternative S2 to 400 m x 400 m (refer to **Appendix G 3** for amendment report). The extension of Site Alternative S2 was required so that Eskom could determine the best position for the substation in the extended area without disturbing the possible heritage sites. The amendment was authorised on 20 May 2019 (EA DEA Reference: 14/12/16/3/3/1/1603/AM1 (Refer to **Appendix G4** for the amended Environmental Authorisation).

However, Eskom did not commence with construction activities within the stipulated timeframes stipulated in the EA (28 October 2016-28 October 2021), therefore the EA has lapsed and Eskom is applying for a new Environmental Authorization for the same site that was amended and authorised.

3. PROJECT DESCRIPTION

3.1 Project Description

Eskom Holdings SOC Limited (hereafter referred to as Eskom), is proposing the development of a new 2 X 20MVA 132/22kV substation and related infrastructure. The proposed new grid connection infrastructure will be situated within the already authorised site that has expired for the same project., Eskom will be upgrading an existing 66kV line to a 132 kV line. The line will run from the substation area to the existing Kiepersol substation in Hazyview, Mbombela Local Municipality, Ehlanzeni District, Mpumalanga Province. The construction of Nkambeni 2 X 20MVA 132/22kV substation will therefore reduce the supply load from Jerusalem substation which is currently the only substation providing electricity in the area. The proposed substation will cover an area of approximately 400m X 400m.

3.2 The infrastructure and key components considered as part of this Basic Assessment process includes:

- HV Feeder Bay
- HV Bus Bar
- Transformer Bay
- MV Road Crossing
- MV Bus-Bar
- MV Feeder Scope (MV Feeder Bay (MV Bypass Busbar Included)
- Substation Control Plant: (Protection, Metering, Telecontrol & DC
- Drainage System
- Control Buildings
- Yard Stones

Technical Description of 20 metres 132KV loop in loop out Power lines

The 20 metres 132KV loop in loop out power lines will be designed and constructed according to Eskom Distribution's Standard Specifications for overhead lines. These two lines will be parallel to each other from the new substation to the existing line and new poles will be planted on the Loop in Loop out points.

Servitude Requirements

The 132KV powerlines will be straight from the substation to the existing line and vice versa. The total servitude required for the 132kV loop in loop out power line will be 52m i.e. the lines will be 21m apart with a servitude of 15,5m on either side totalling to 52m. Vegetation along the servitude should be cut to a maximum of 100mm from the ground, no de-stumping or uprooting will be allowed along the servitude. All alien species should be monitored and removed accordingly using herbicides.

Access

Access is required during both the construction and operational phases of the proposed project. The site proposed for development has largely been transformed through grazing practices and already has gravel roads in place for these purposes. Where possible, existing access roads/tracks internal access roads will be used to gain access to construction sites to the substation and associated infrastructure. Where no access roads/tracks exist, the access points and roads will be negotiated with the relevant landowner and will be limited to single tracks as close to the servitude/within the servitude as possible. These will be established during the construction phase. Access roads will enable the transportation of construction material as well as construction teams to the site and facilitate maintenance activities during the operational phase. Where possible access routes will be rehabilitated when no longer required.

Activities associated with the project

The Proposed Nkambeni Substation will be constructed in the following simplified sequence:

- Establishment of construction camp, vegetation clearance and construction of access roads (where required);
- Construction of terrace and foundations;
- Establish Nkambeni 2 x 40MVA 132/22kV Substation by establishing the following:
 - Build the substation platform according to the civil design.
 - Build the substation earth mat and all equipment foundations as per 240-134369472.
 - Install all substation apparatus on the HV yard, TRFR bay, MV yard and in the control room.
 - Apply yard stoning with a layer thickness of 150mm as per 240-108982466.
 - Build 4 x 22kV feeder lines into the substation according to the scope work detailed in the separate designs.
- Commission and hand over the assets.
 - Test the substation earth electrode resistance and compare it with the design as per 240-101940513.
 - Test the substation earth grid continuity test as per 240-84854974.
 - Conduct all Tests as required by Eskom and those specified in the design.
 - Dismantle the temporary power supply and site establishment.
- Rehabilitation of any disturbed areas and protection of erosion sensitive areas;
- Continued maintenance.

CONSTRUCTION PHASE

Construction Camps

The contractor would need to set up a site camp. The contractor will be encouraged to utilise already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. Given the nature and sensitivity of the surrounding environment, the proposed project will only entail the construction of laydown areas and this will be negotiated accordingly with the landowners via the existing Eskom negotiation processes. Further, the laydown areas will be established in accordance with Eskom Distribution's standard for construction camps.

Construction of substation

Substations are an assemblage of equipment within a fenced area that switch, change, or regulate voltage in electric transmission and distribution systems used to transform voltages for delivery of electricity to homes and businesses. Substation construction will require stripping of topsoil, excavation of additional material, and placement of impervious surfaces which all aid in the transport of sediment-laden storm water. Storm water treatment systems, such as detention ponds or infiltration basins will be required on site as part of National Pollutant Discharge Elimination System (NPDES) permit Storm Water Pollution Prevention Plan (SWPPP). In addition to the NPDES requirements, presented in detail in Volume II, most substations are also obligated to have an Environmental Protection Agency (EPA) required spill prevention control and countermeasure (SPCC) plan. SPCC plans will ensure that facilities put in place containment and other countermeasures that would prevent hazardous spills that could reach navigable waters. The excavations shall be kept covered or barricaded in a manner accepted by the Supervisor to prevent injury of people and livestock. Failure to maintain proper protection of excavations may result in the suspension of excavation work until proper protection has been implemented.

Stringing

The process of Stringing follows. The process of "Stringing" a power line is where wire is rolled out along and fixed to the towers. Generally, power lines stretch across wide areas and have multiple sets of wires running along its length, making the task all the more complex. The logistics, planning and execution of stringing kilometres of multiple wires to a line is highly specialised and intensive. Power lines cross many high risk areas like roads, railways, buildings or bodies of water making safety and risk assessment a primary focus.

This process includes the following among others:

- Setting up: Hanging Pulleys, erecting hurdles (bridging structures), setting up winch/brake sites,
- Pulling Draw Wire and Conductor wire.
- Clamping of Suspension Towers.
- Strain Towers.
- Sagging Wire.
- Installation of Spacers

The line is tensioned from each cable station to ensure minimum ground clearance heights are achieved. Rehabilitation is a continuous process during the construction phase.

OPERATIONAL PHASE

The transmission lines will be in operation immediately after completion of the construction activities and will remain operational. Subsequent maintenance and refurbishment would normally occur during the operational lifetime of the power line which would necessitate the utilisation of access roads that will be created along the servitude of the transmission power line. During the operational phase of the project general farming activities, such as the grazing of animals and the cultivation of crops, may continue within the servitude. However, the servitude will need to be kept clear of any vegetation, structures or activities that may interfere with the line. Eskom will also require access to the servitude in order to undertake maintenance and perform any necessary repair work.

REHABILITATION PHASE

Following completion of each of the construction stages described above, site reinstatement and rehabilitation will take place as follows:

- Removal of excess building material, and waste;
- Repairing any damaged caused as part of the construction activities;
- Rehabilitating the area affected by temporary access roads;
- Rehabilitation existing roads and
- Replacing topsoil and re-vegetating as recommended.

WATER PROVISION, EFFLUENT AND ELECTRICITY

Portable Water

Portable water will be provided on site during construction, and water for construction will be sourced from Mbombela Municipality.

Sewage

No sewage flow is anticipated during the construction or operational phase of the project. Chemical toilets will be made available for use by project staff, which will be serviced periodically by the supplier and will be stipulated in the EMP. Under no circumstances shall use of the veld be permitted.

Solid Waste Disposal

Waste collection bins will be made available at the facility and emptied regularly. Waste will be discarded off at a registered land fill site.

Electricity

Any power required during the project life cycle will be sourced directly from Eskom.

Stormwater Management

Stormwater management is required both during and after the construction to prevent degradation of the water quality in water resources and negative impacts to the surrounding environment. Impacts during both construction and operational phases should be controlled at the source, to minimise or prevent the long-term and short-term impacts. Stormwater drainage will be put in place.

3.3 Locality of study site

The study area is located in Mpumalanga Province, in the small village of Mahushu, situated between the towns of White River and Hazyview, approximately 40 km North-East of Nelspruit and approximately 10km from Hazyview within the Mbombela Local Municipality. The coordinates and property details are outlined in **Table 3** below.

Table 3: Coordinates and Property Details

Substation	Coordinates	Property Details	21 Digit Code	Size
Corner 1	25°7'22.18"S; 31°7 '06.22"E	The farm Burgers Hall 21 JU Portion 115	T0JU0000000002100115	160000m ²
Corner 2	25°7'10.93"S; 31°7 '11.36"E			
Corner 3	25°7'06.31"S; 31°6 '58.09"E			
Corner 4	25°7'18.23"S; 31°6 '52.97"E			

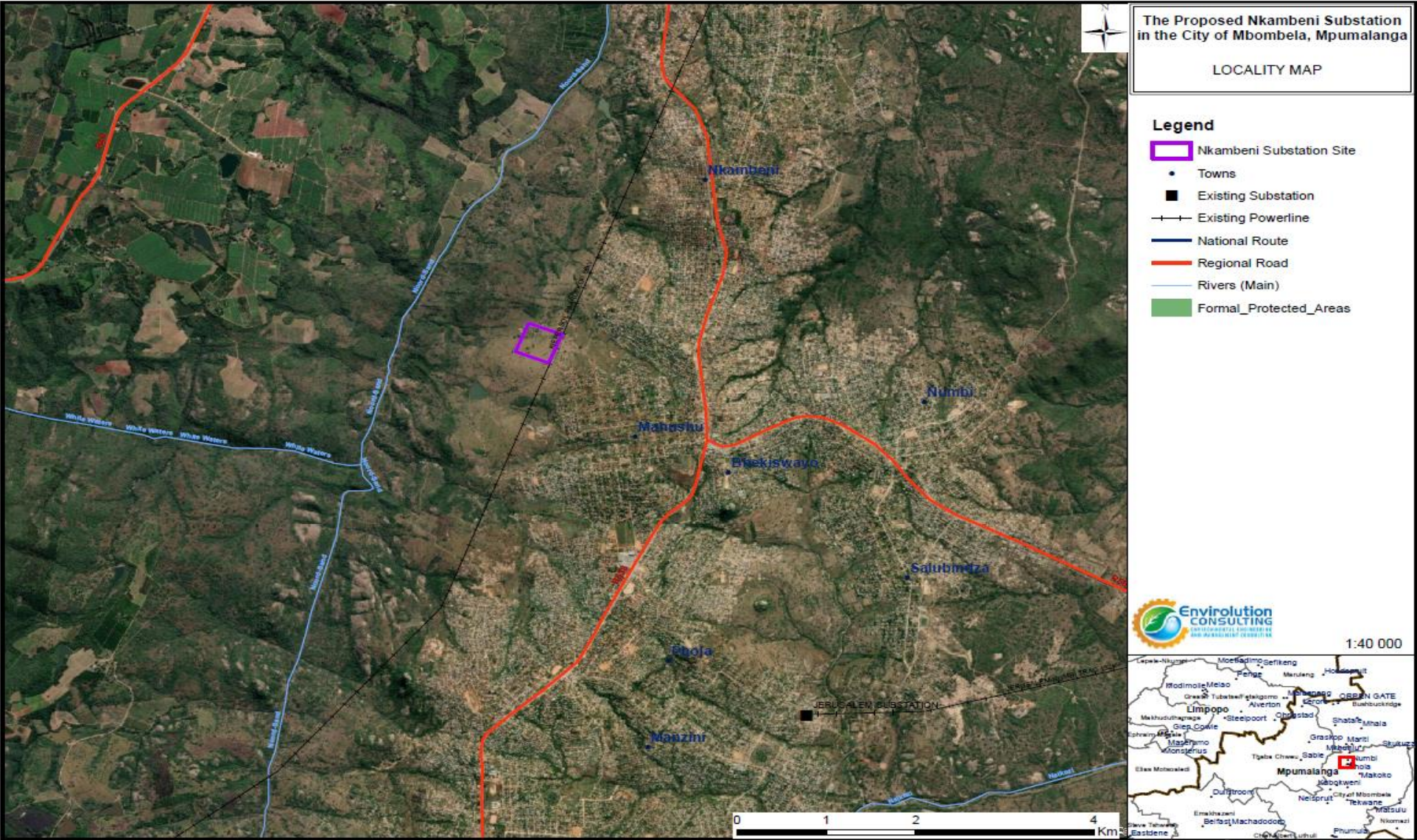
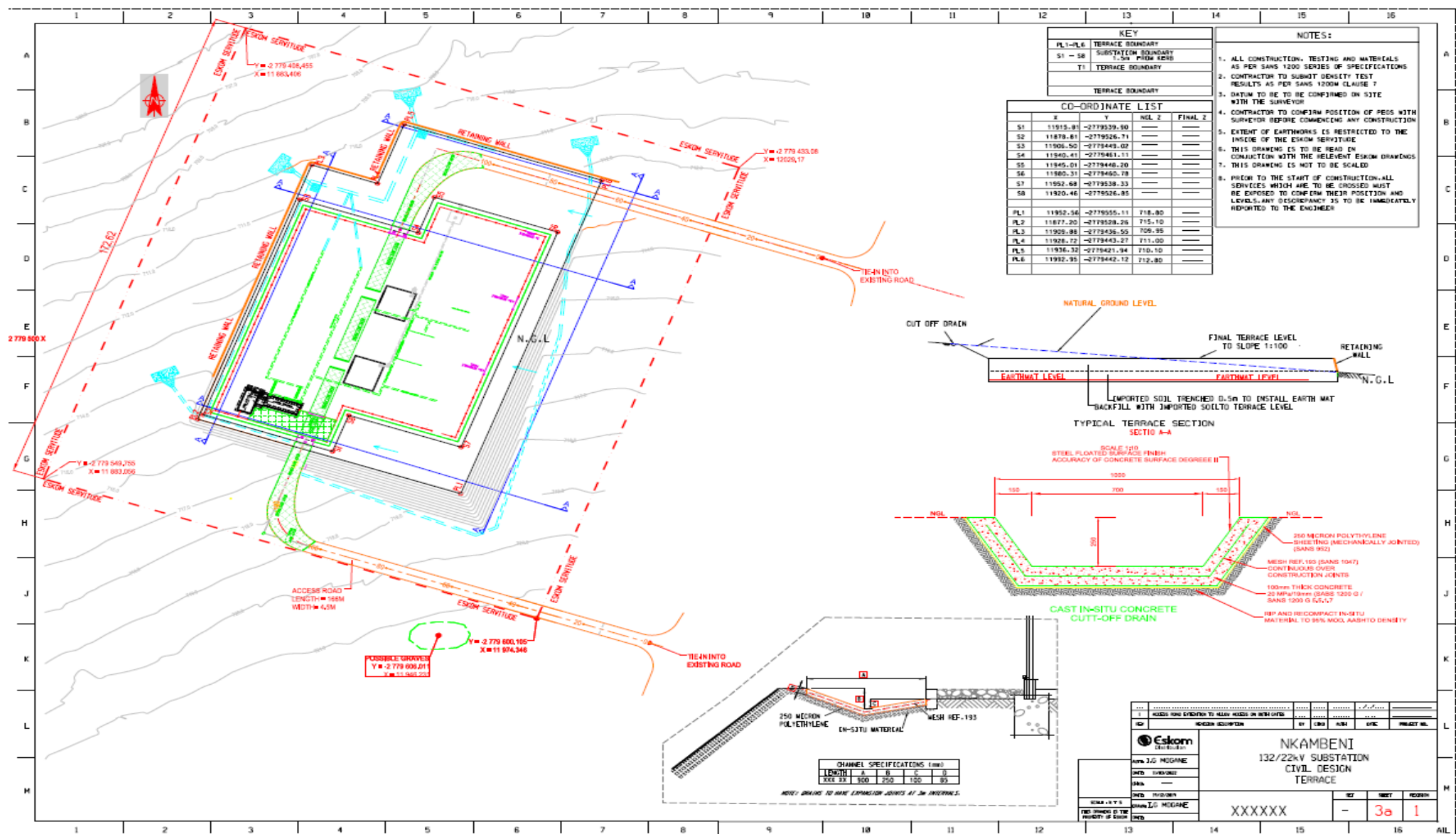


Figure 2: Locality Map



4. ALTERNATIVES

4.1 Feasible and Reasonable Project Alternatives

An EIA process must contain the consideration of alternatives, which can include site alternatives (i.e. development footprint), activity, technology and site access alternatives, as well as the “do-nothing” alternative as per the requirements of Appendix 3 of the 2014 EIA Regulations (GNR 326). Alternatives are to be assessed in terms of biophysical, economic, social and technical factors.

Applicable alternatives are discussed below and where no alternatives are found to be applicable, a motivation has been included.

4.2 Site Specific Alternatives

Eskom received an Environmental Authorisation (EA DEA Reference: 14/12/16/3/3/1/1603), approved 28 October 2016, authorised the construction of a 2 x 20 MVA 132/22kV substation and 20 m 132 loop in and loop out lines of an extent of approximately 150 m x 150 m on the Remaining Extent of the farm Nkambeni 950 JU (the then Preferred Site Alternative S1). Three more site alternatives were assessed during the application of this EA (Refer to **Appendix G1** for the Basic assessment report and **Appendix G2** for the Environmental Authorisation granted in 20016).

In 2018, an application was made to amend the EA to authorise Site Alternative S2 (Now proposed site) because the tribal authority did not condone the construction of the substation on the then Preferred Alternative Site S1 (refer to Figure below). Due to the existence of possible heritage sites on the location, Eskom also proposed to extend the area allocated for Alternative S2 to 400 m x 400 m. The extension of Site Alternative S2 was required so that Eskom can determine the best position for the substation in the extended area without disturbing the possible heritage sites. The amendment was authorised on 20 May 2019 (EA DEA Reference: 14/12/16/3/3/1/1603/AM1 (Refer to **Appendix G3**) for amended Environmental Authorisation.

However, Eskom did not commence with construction activities within the stipulated timeframe in the EA (28 October 2016-28 October 2021), therefore the EA has lapsed and Eskom is applying for a new Environmental Authorization.

Based on the above background, Eskom does not consider any alternatives (site, design and technology) for this new application as the proposed site was already authorised on the amended EA and the scope is still the same. Therefore, no other alternatives have been assessed in this report.

Need and desirability of the project

For Eskom to honour its' mandate and commitment to meet the increasing needs of the end user(s), it has to establish and expand the infrastructure of both transmission and distribution power lines and substations on an on-going basis. As a result of an increase of the load, it is necessary to reinforce existing electrical infrastructure and establish new infrastructure as and when needed. The need for the project arose due to the following:

- It will cater for new load and future additional load.
- System Average Interruption Duration Index (SAIDI) will be improved.
- More back feed will be established.
- Network reliability.

Benefits of the project

The proposed project is beneficial as it will allow for load growth in the region. At the local level, the benefits of the project would center on ensuring improved reliability of supply as well as entrench the reach of electricity into communities. It is envisaged that the proposed project would ensure that marginal communities in the region are supplied with electricity. This will indirectly have an added benefit as it may reduce the community's reliance on firewood as their primary energy source, thus allow for sustainable livelihoods. Electrification has significant positive benefits from a socio-economic and ecological perspective.

Supporting Strategies

- At the regional level, the project would contribute to reliability of power supply. There would also be a less tangible but nonetheless important benefit of positioning the municipalities on the lead in terms of sustainable energy supply.
- At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (DME 1998). The priorities to which this project would contribute are laying the groundwork for promoting electrification and power supply.

5. GOVERNANCE FRAMEWORK AND ENVIRONMENTAL PROCESS

All legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA Regulations are discussed below.

5.1 Listed Activities for Basic Assessment Process

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as amended and listing notices GNR 327, 325 and 324 of the Environmental Impact Assessment Regulations, 2014 as amended in 07 April 2017 (GNR 326), a Basic Assessment process is required for the proposed project. **Table 4** below contains the listed activities in terms of the EIA Regulations and includes a description of those project activities which relate to the applicable listed activities.

Table 4: Listed Activities

Listed activities	Description of project activity that triggers listed activity
Listing Notice 1 (GNR 327, 07 April 2017), Activity 11 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.	2 X 20MVA 132/22kV Substation will be constructed. 20 metres 132KV Loop in-loop out line will be erected. The proposed substation is outside of an urban area.
Listing Notice 1 (GNR 327, 07 April 2017), Activity 27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- i) the undertaking of a linear activity; or ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	Construction of a substation, covering approximately 400 x 400 m of indigenous vegetation will be cleared.

The above listed activities have triggered a Basic Assessment Process, these activities may not commence without an Environmental Authorisation from the Competent Authority. The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts and risks associated with the proposed project are taken into consideration;
- Public Participation Process is conducted in line with EIA Regulations (i.e. to afford any Interested and or Affected parties (I&AP) sufficient opportunity to provide comments); and
- Sufficient information is provided to decision makers in order to ensure an informed decision-making.

This report has been compiled in accordance with the requirements of the EIA Regulations of 2014, as amended, and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

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

Several other Acts, Standards or Guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 5** below, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 5: Applicable Legislation, Policies and/or Guidelines

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
Constitution of the Republic of South Africa (Act No. 106 of 1996)	<p>The Constitution is the supreme Law in South Africa. Chapter 2 of the Constitution contains the Bill of Rights including section 24 which provides that:</p> <p>"Everyone has the right-</p> <ul style="list-style-type: none"> (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that- <ul style="list-style-type: none"> (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." <p>Other rights protected by the Constitution relevant to environmental authorisations include the right to administrative justice and to</p> 	South African Government	While no permitting or licensing requirements arise directly, this paves the way for the National Environmental Management Act which is considered the overarching framework for Environmental Impact Assessments thus takes applicability there.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<p>information, and rights, known as "socio-economic rights", such as access to clean air. The right to administrative justice is relevant to application and awarding of environmental authorisations because decisions made by the competent authority in the course of the environmental assessment process (such as the decision to accept a basic assessment report) as well as a final decision on the application fall into the definition of "administrative action". The construction phase of the Project would need to take these principles into account.</p>		
National Environmental Management Act (Act No. 107 of 1998)	<p>NEMA requires, inter alia, that:</p> <ul style="list-style-type: none"> • Development must be socially, environmentally, and economically sustainable. • Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied. • A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. 	National Department of Forestry, Fisheries and the Environment (DFFE) Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)	The Basic Assessment is undertaken in accordance with the requirements of the Environmental Impact Assessment Regulations of 2014, as amended, and as required in terms of the National Environmental Management, 1998 (Act No. 107 of 1998).

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<p>EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p>		
National Environmental Management Act (Act No. 107 of 1998)	<p>A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts.</p> <p>In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.</p>	National Department of Forestry, Fisheries and the Environment (DFFE) Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)	<p>While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the impact assessment phase.</p> <p>The implementation of mitigation measures is included as part of the Project EMP and will continue to apply throughout the life cycle of the project.</p>
National Water Act (Act No. 36 of 1998)	<p>Section 21 water uses as per the NWA includes:</p> <p>21(a): Taking water from a water resource;</p> <p>21(b): Storing water;</p>	Department of Water and Sanitation (DWS)	The proposed site and development require a Water Use License (General Authorisation) as it is within 500m of a

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<p>21(c): Impeding or diverting the flow of water in a watercourse;</p> <p>21(d): Engaging in a stream flow reduction activity;</p> <p>21(e): Engaging in a controlled activity;</p> <p>21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit;</p> <p>21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;</p> <p>21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process;</p> <p>21(i): Altering the bed, banks, course or characteristics of a watercourse;</p> <p>21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and</p> <p>21(k): Using water for recreational purposes.</p> <p>For wetland areas, development within a 500m buffer triggers the act.</p> <p>For rivers, development within a 100m buffer triggers the act. Any activity that triggers any of the above water uses will require a Water Use License.</p>		<p>wetland so it does triggers Section 21 c and i, water use of the NWA. DWS will also be kept as an I&AP on the projects database.</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	Given the sensitivity associated with a project, DWS will determine whether the project will follow a General Authorisation process or a Water Use License Application process.		
National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)	This Act provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act (Act No. 107 of 1998); the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.	National Department of Forestry, Fisheries and the Environment (DFFE)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project in proper management of the development of the substation and associated infrastructure to prevent soil contamination.
National Environmental Management: Waste Act (Act No. 59 of 2008)	The NEMA: WA came into effect on the on 1st July 2009. Section 20 of the Environment Conservation Act (Act No. 73 of 1989), under which waste management was previously governed, was repealed. In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing.	National Department of Forestry, Fisheries and the Environment (DFFE) National Department of Forestry, Fisheries and the Environment (DFFE) – lead authority for regulating hazardous waste.	No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
		Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)	
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	<p>Section 18, 19 and 20 of the Act allow certain areas to be declared and managed as “priority areas”.</p> <p>The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</p> <p>Dust Control Regulation Control Regulations, R. No. 827 of 1 November 2013.</p>	National Department of Forestry, Fisheries and the Environment (DFFE)	<p>While no permitting or licensing requirements arise from this legislation for the site, this Act will find application during the construction phase of the project.</p> <p>The implementation of dust mitigation measures are included as part of the project EMPr and will continue to apply throughout the life cycle of the project.</p> <p>Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
National Heritage Resource Act, 1999 (Act No. 25 of 1999)	<p>Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length.</p> <p>In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.</p> <p>If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is obtained.</p>	<p>South African Heritage Resources Association (SAHRA)</p> <p>Mpumalanga Provincial Heritage Resources Authority MPHRA)</p>	Should any heritage/ palaeontology sites/ artefacts be unearthed during excavations, a permit would be required to be obtained from SAHRA.
National Energy Act (Act No. 34 of 2008)	<p>The purpose of the National Energy Act is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation; while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of energy.</p> <p>The objectives of the Act, are to amongst other things, to:</p> <ul style="list-style-type: none"> • Ensure uninterrupted supply of energy to the Republic. 	<p>National Department of Forestry, Fisheries and the Environment (DFFE)</p> <p>Department of Mineral Resources and Energy (DMRE)</p>	This act is applicable throughout the life cycle of the proposed project.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<ul style="list-style-type: none"> Promote diversity of supply of energy and its sources. Facilitate energy access for improvement of the quality of life of the people of the Republic. Contribute to the sustainable development of South Africa's economy. <p>The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life.</p>		
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	National Department of Forestry, Fisheries and the Environment (DFFE)	No permitting is required. The act finds applicability during the public participation process phase of the Basic Assessment process.
Occupational Health and Safety Act (Act No. 85 of 1993)	The Occupational Health and Safety Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	Department of Labour (DoL)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the general public. E.g. Protection of workers on

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
			site through provision of Personal Protective Equipment's; Training and other health and safety amenities.
Hazardous Substances Act (Act No. 15 of 1973)	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitizing, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <ul style="list-style-type: none"> • Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance; • Group IV: any electronic product; • Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force. 	Department of Health (DoH)	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
National Road Traffic Act (Act No. 93 of 1996)	<p>The technical recommendations for highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p> <p>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include:</p>	South African National Roads Agency Limited (SANRAL) Provincial Department of Transport	This act is applicable during the construction phase of the project when material is being transported to and from the site.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<ul style="list-style-type: none"> • Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. • Transport vehicles exceeding the dimensional limitations (length) of 22m. • Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width). 		
<p>Policy Guidelines</p> <p>The following Guideline documents have been considered in the preparation of this report:</p> <ul style="list-style-type: none"> ▪ Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010; ▪ Implementation Guidelines (published for comment) in Government Notice 603 of 2010 ▪ Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005); ▪ Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007) ▪ DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7. 			
<p>Other applicable guidelines include the following:</p> <ul style="list-style-type: none"> ▪ Integrated Energy Plan (IEP), 2016 ▪ Integrated Resource Plan for Electricity (2010-2030) ▪ National Development Plan 2030 (2012) ▪ National Infrastructure Plan 			

6 PUBLIC PARTICIPATION PROCESS

6.1 Aim of the Public Participation Process

The aim of the Public Participation Process is to allow Interested and Affected Parties (I&APs) the opportunity to gain an understanding of the project and consider all facets of the proposed activities. The Public Participation Process will:

- Provide I&APs with information about the proposed substation development activities and associated potential impacts;
- Allow I&APs the opportunity to provide input, such as concerns or queries, on the proposed project; and
- Incorporate the input raised by I&APs in the study and ultimate decision-making process.

6.2 The following activities will take place during the public participation process:

- **Identification of Key Stakeholders**

As required by the EIA Regulations of 2014, relevant local, provincial and national authorities, local forums and representatives as well as surrounding land owners and occupants must be notified of the environmental process during the initial application. Refer to **Appendix E2** for written notification wording. Proof of this notification will be included in the Final Basic Assessment Report (FBAR).

Relevant government authorities (organs of state) have been automatically registered as IAPs. In accordance with the EIA Regulations of 2014, all other persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders and included in future communication regarding the project; the advertisement and notifications advise that IAPs register as such. All respondents are then to be placed on the project database. This database is supplemented by IAPs who contacts the project manager to be included on the database. The database is used throughout the process to inform the stakeholders of the project. The stakeholder database will be updated throughout the process. Refer to **Appendix E4** for the I&AP database.

- **Newspaper Advertisement**

An advertisement, notifying the public of the availability of the Draft Basic Assessment process and/ or requesting I&APs to register with, and/ or submit their comments to Envirolution Consulting (Pty) Ltd will run in the Mpumalanga news newspaper on Wednesday, 10 May 2023. Refer to **Appendix E3** for newspaper advertisement wording. Proof of this advert will be attached within the FBAR.

- **Site notices**

Four site notices will be erected on site and at visible and accessible locations close to both the site options in order to inform surrounding communities and immediately adjacent landowners of the proposed development and the availability of the DBAR for a 30-day public review period for commenting purposes. Refer to **Appendix E1** for site notice wording. Proof by means of photographic evidence of the site notices will be included in the FBAR.

- **SAHRIS Upload**

The project details will also be uploaded onto the SAHRIS portal which will allow for more awareness as well as more I&AP participation. Proof hereof will be included in the FBAR.

- **Direct notification of identified I&APs**

Identified I&AP's, including key stakeholders representing the sectors outlined below, will be directly notified of the proposed development by e-mail on Wednesday, 10 May 2023

- Provincial Authorities
- Local Authorities
- Service providers
- Ward Councillors

Please refer to **Appendix 2** for the Notification Letters. Proof of email notifications that will be distributed to I&AP's will be included in the FBAR.

- **Hand-deliveries/ knock and drops**

Hand-deliveries of notification letters will be made to landowners and adjacent landowners on Wednesday, 10 May 2023, to notify and inform them of the proposed project. Proof of the Knock and Drop register will be included in the FBAR.

- **Availability of Draft Basic Assessment Report for public review**

The DBAR will be released for a 30-day public review period from **10 May 2023** until **12 June 2023**. Organs of state, I&AP's and stakeholders will be notified by email and/ or post of the availability of the report along with all appendices including the EMPr and specialist studies for public review and comment. An online system is used to submit applications and the BAR to DFFE as the Competent Authority; this will be done accordingly. Hard copies of the report will be delivered to the Commenting Authorities (Mpumalanga Department of Agriculture Rural Development and Environmental Affairs; City of Mbombela Local Municipality and Ehlanzeni District Municipality). A hard copy of the report will be available for review at the Hazyview Public Library located at 1 Townsend Street, Hazyview Suburbs, 1242, South Africa. Proof will be attached to the FBAR. The report will also be made available via a dropbox link.

During this period, comments/ concerns are expected from organs of state, stakeholders and I&APs. All comments received during the DBAR review period will be adequately addressed and incorporated into the FBAR.

- **Focus Group Meeting**

A Focus Group Meeting (FGM) with the councillors and ward committee of the respective wards, as well as community forums will be scheduled to introduce the project and present the findings of the BAR. During this meeting, the councillors will advise whether a full public meeting will be required or not. Meeting Minutes will be included in the FBAR.

- **Public Meeting**

As per above, if the councillors suggest a public meeting, one will be scheduled where all I&AP's will be invited to attend. The findings of the Basic Assessment Report will be presented for discussion and all comments and concerns raised will be addressed and included as Meeting Minutes within the FBAR.

- **Submission of FBAR**

Following the DBAR review period, all issues raised by authorities and the public will be summarised and responded to and included in the Comments and Response Report which will be included in the FBAR. The FBAR will be updated (where necessary), taking stakeholder input into account. The FBAR will then be submitted to DFFE for the 107-day decision-making period to issue an Environmental Authorisation.

- **Notifying I&APs of the Environmental Authorisation**

Once the Environmental Authorisation is received, I&APs will be notified of the outcome and granted a 20-day intent to appeal period.

7 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the establishment of the Nkambeni Substation and associated infrastructure. The information is provided in order to assist the reader in understanding the pre- development environment and the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical and social environments that could be directly or indirectly affected by the development or could affect proposed infrastructure have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this BA process is being conducted.

7.1 Screening Report

Proposed Development Area Environmental Sensitivity: Screening has been undertaken on the DFFE website to determine the sensitivities of the proposed substation site. According to the Screening Report for the proposed Substation attached as **Appendix G5**, Specialist assessments identified

Table 6: Environmental Sensitivities Identified

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme	X			
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Palaeontology Theme			X	
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist assessments identified: Based on the selected classification shown in Table 6 and the environmental sensitivities of the proposed development footprint, the following specialist assessments have been identified for inclusion in the assessment report (see **Table 7**).

Table 7: Specialist assessments identified by the screening tool

No:	Theme	Has this been undertaken? Yes✓/No (X)
1	Agricultural Impact Assessment	X
2	Archaeological and Cultural Heritage Impact Assessment	✓

3	Palaeontology site verification	✓
4	Terrestrial Biodiversity Site verification	✓
5	Aquatic Biodiversity Impact Assessment	✓
7	Plant Species Assessment	✓
8	Animal Species Assessment	✓

7.2 Reasons for exclusion of the following identified specialist study:

7.2.1 Agricultural Potential, Land use and Capability

A very high agricultural sensitivity has been identified in terms of National Environmental Screening tool.

The Local Municipality Spatial Development Framework June 2008 states that *the key development issues that face area include environmental degradation and the over-utilisation of natural and physical resources. This is due to the growth of dispersed settlements with limited infrastructural services. The result is that individuals depend on the environment for energy and water which places the environment at risk and result in human energy being utilised toward non-productive ends.*

The study area is covered with permanently modified natural vegetation which has been subject to detrimental human intervention in the form of intensive cultivation, subsistence grazing and other forms of resource harvesting for as long as could be determined. There are no formal conservation areas in close proximity to the study area. Evidence of the decreasing use for agricultural activities over the last years on the site is visible in the historical google earth images below. (**Figures 5, 6 and 7**). The area was being utilised for agricultural activities and grazing by community live stock. During the initial impact assessment process, the community indicated that the Proposed site is not be used by the community any more, but that the initial Site Alternative 1 is being utilised.

Should it be required, agricultural activities will be able to continue around the substation area after construction has been completed. The area lost will be the 150 m x 150 m footprint area within the 400m x400m that is being applied for

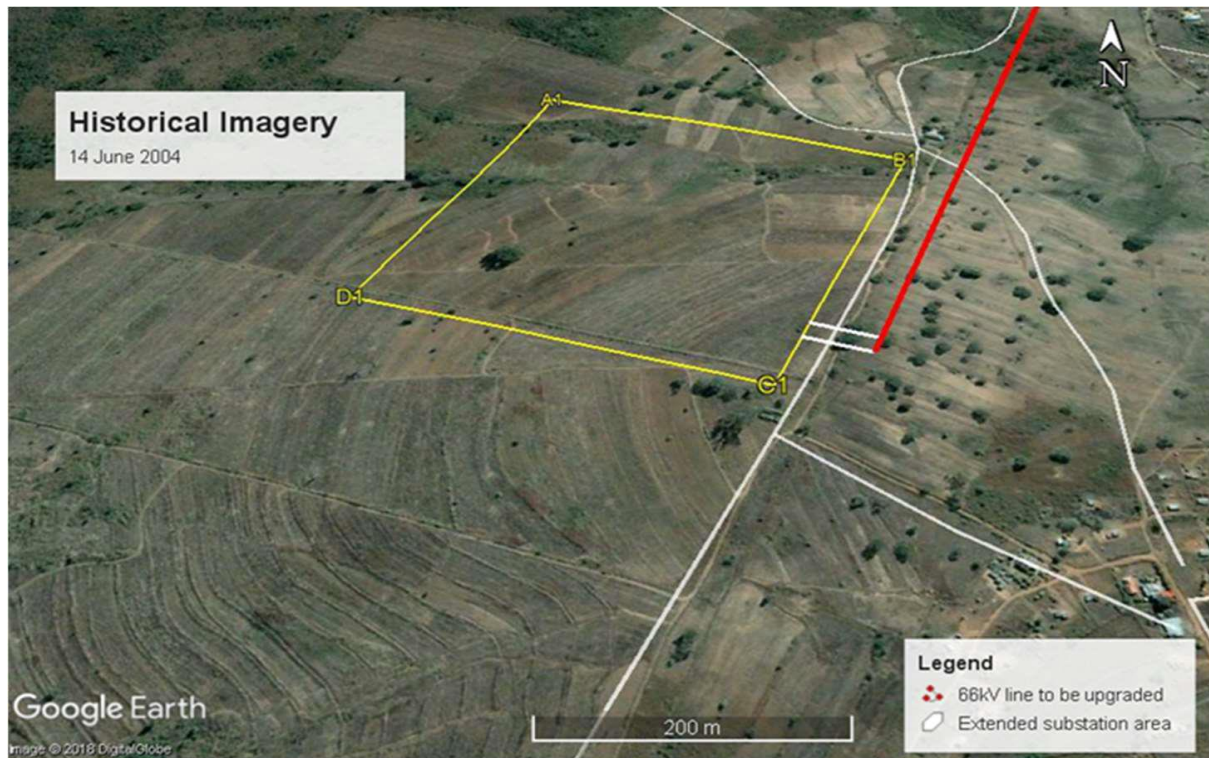


Figure 5: Historical image of June 2004

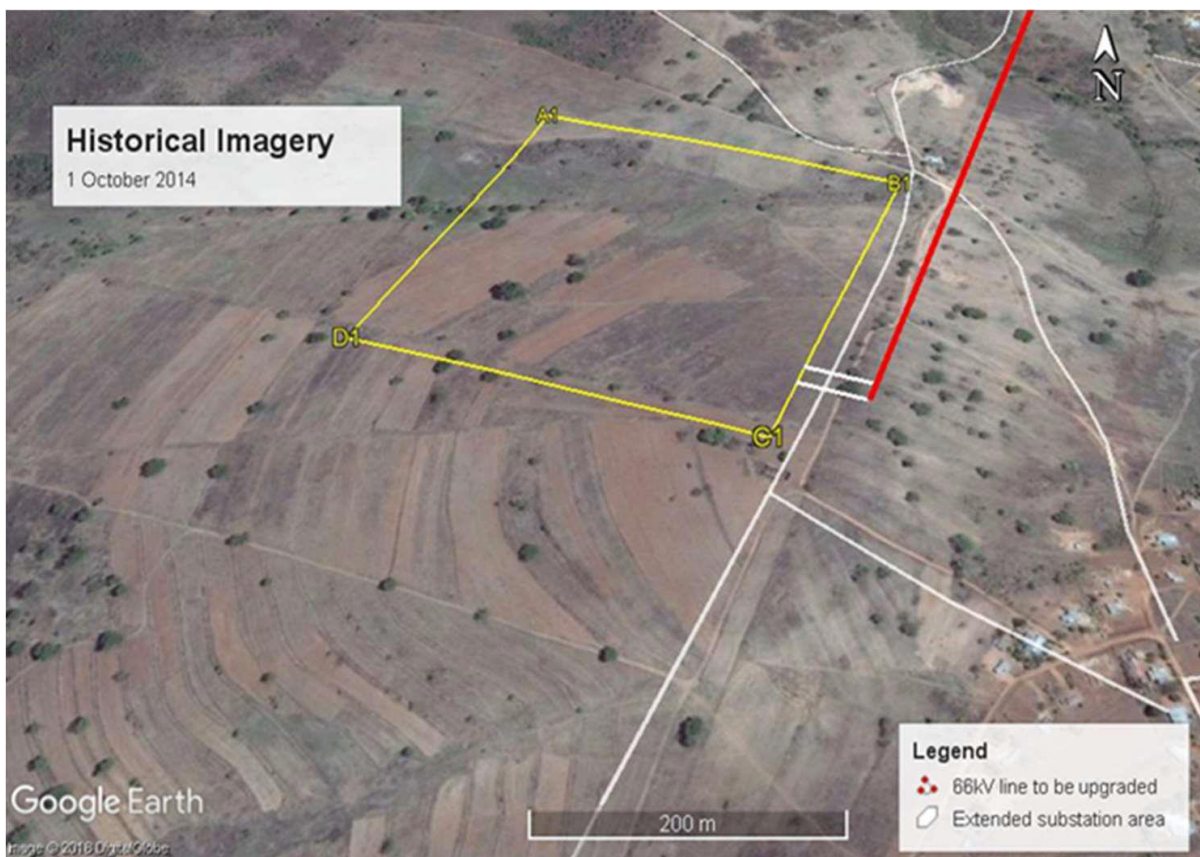


Figure 6: Historical image of October 2014

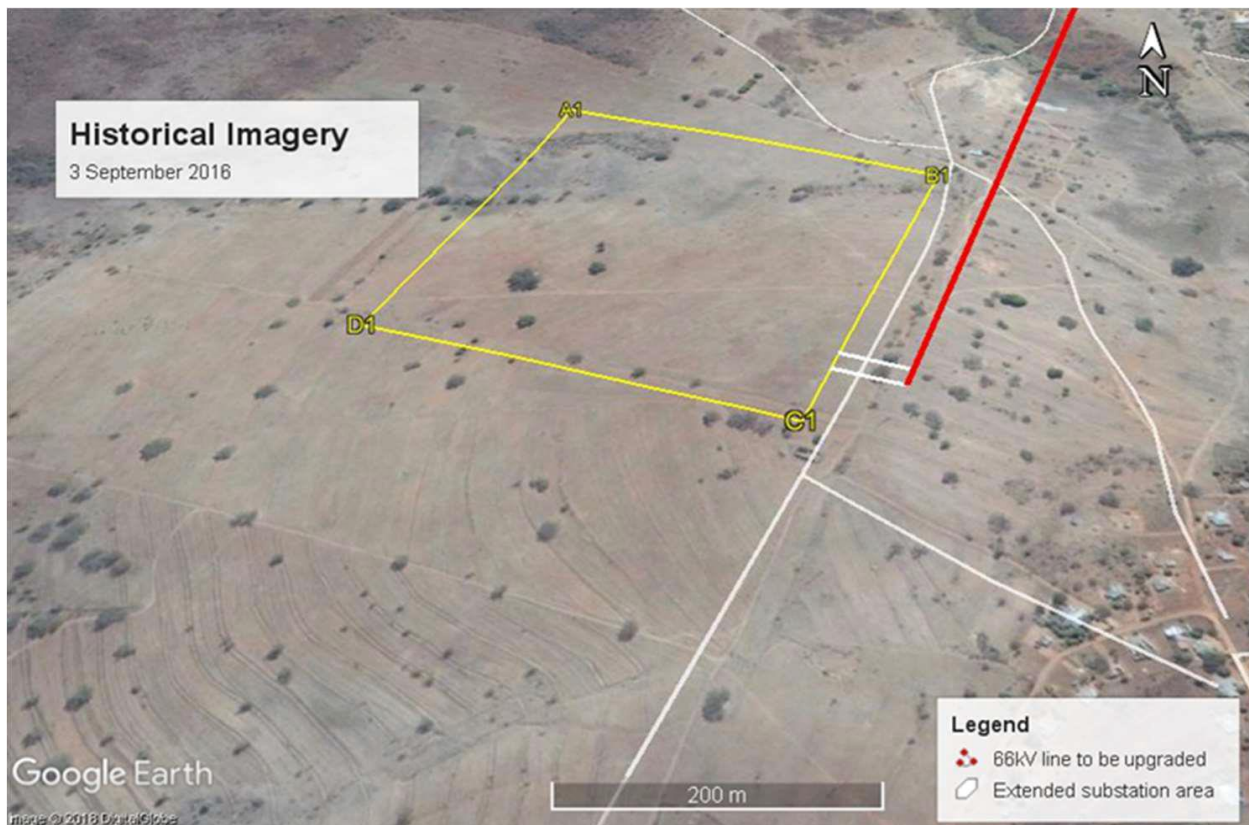


Figure 7: Historical image of September 2016

More intense agricultural areas are located South East of the proposed site, please refer to **Figure 8** below.

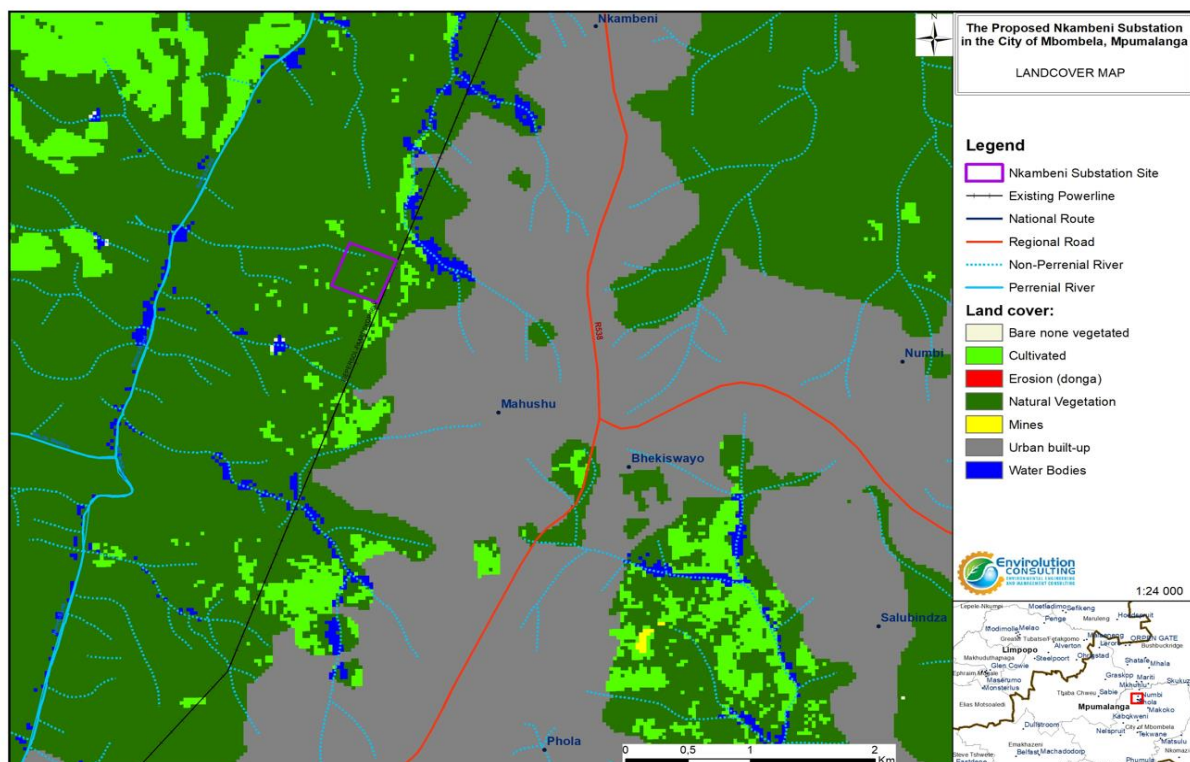


Figure 8: Land cover of the proposed site

7.2.2 Civil Aviation Assessment:

The proposed site is located approximately 30 km north of the Kruger Mpumalanga International Airport. In terms of the proposed height of the infrastructure (18m) it is highly unlikely to have an impact on civil aviation. The electric and magnetic field (EMF) levels decrease rapidly with distance from the transformers and other electrical equipment. Most of the time, EMF levels drop to the same as surrounding background levels at a distance of 90 to 100 meters from the substation area (Public Service Commission of Wisconsin). It is also therefore unlikely that the EMF generated by the substation on the proposed site could influence civil aviation instrumentation.

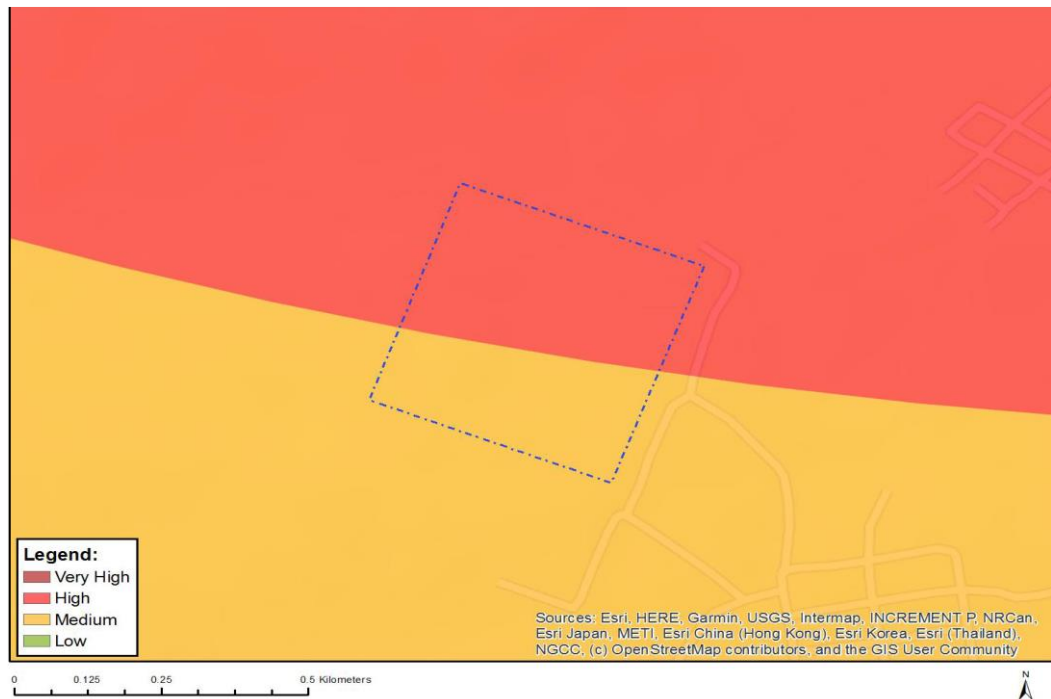


Figure 9: Civil Aviation Sensitivity

Sensitivity Map, National Screening Tool, 24 Jan 2023

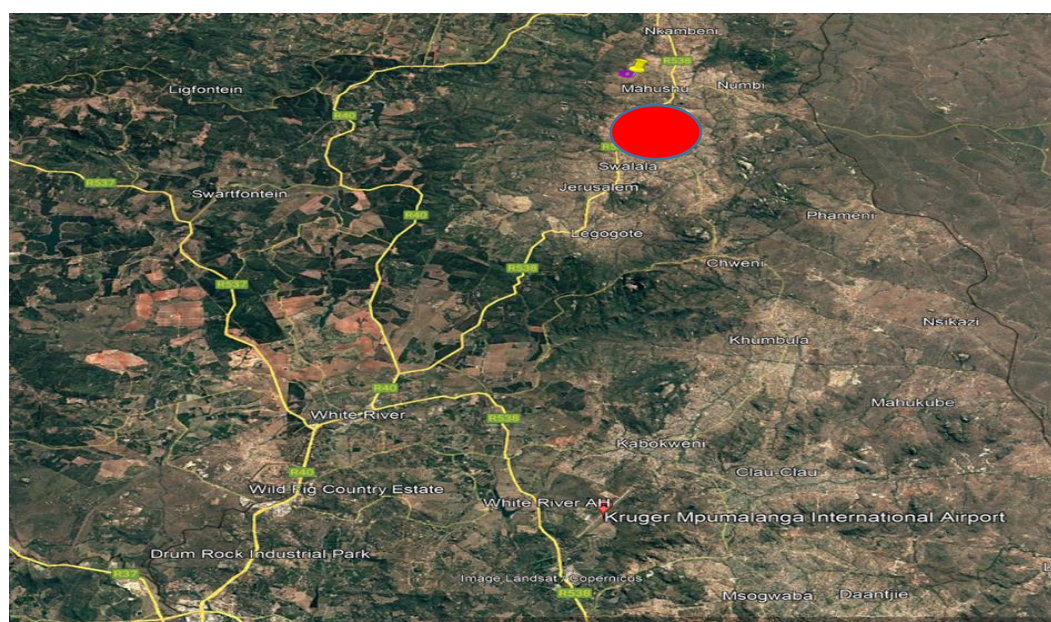


Figure 10: Site depicted in the red circle

The section below discusses Biophysical Characteristics of the Study Area and Surrounds and all specialist studies undertaken

7.3 Biophysical Characteristics of the site and surrounds

7.3.1 Topography

The proposed Nkambeni site is sloped, and this may have an impact on the final footprint of the proposed 150m x 150m substation area within the 400m x 400m proposed site. Please see map below. From the map it is clear that there is a large area in the extended site that is quite flat. Enough relative flat terrain is present in the extended area to accommodate the substation without compromising the heritage sites identified on the area. The figure below provides an illustration only of where the substation could be located within the proposed area. The exact location will be determined by Eskom based on their operational requirements and the location of the Maroela trees on site.

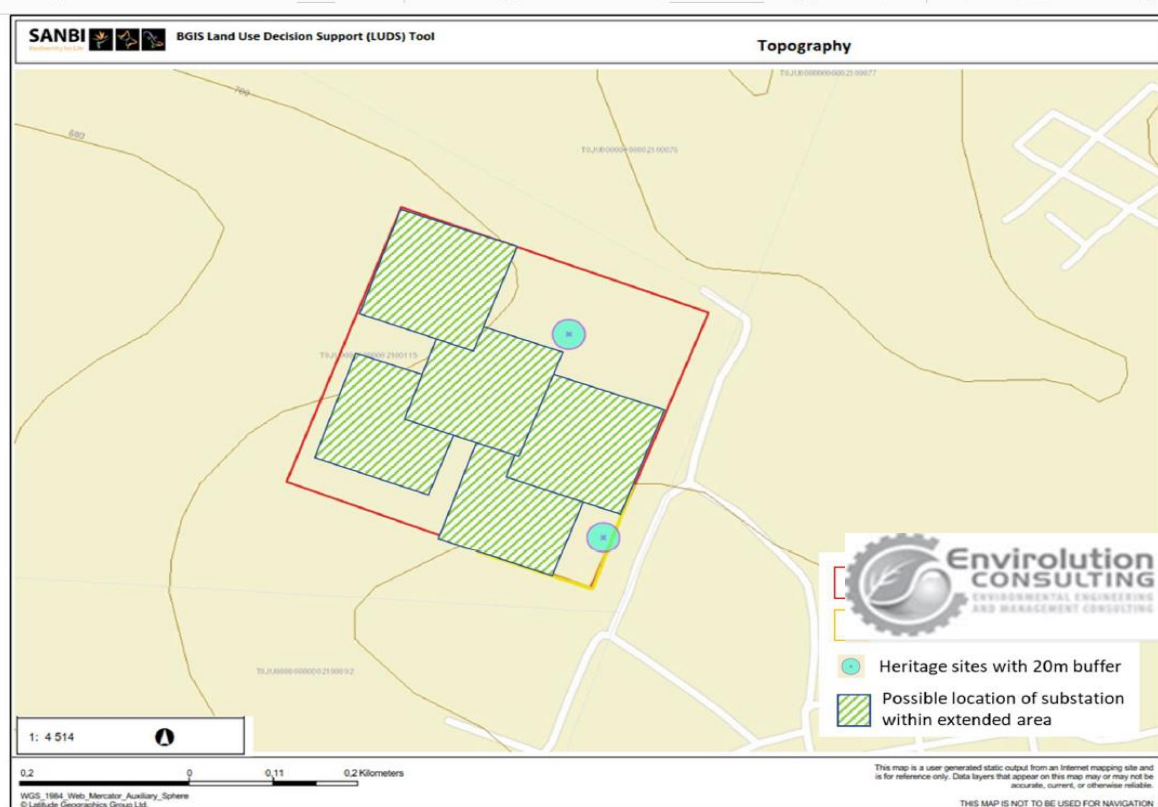


Figure 11: Contour Map

7.3.2 Climate

Summer rainfall with dry winters. MAP from about 700 mm on the footslopes of the escarpment in the east to about 1 150 mm where it borders on grassland at higher altitude to the west. Frost infrequent to occasional at higher altitude. Mean monthly maximum and minimum temperature for Nelspruit 35.7°C and 1.6°C for October and July, respectively. Corresponding values for Barberton-Agr 36.0°C and 0.8°C for October and June, respectively. Both weather stations lie at the eastern edge of the u it at lower altitude.

7.3.3 Geology

Most of the area is underlain by gneiss and migmatite of the Nelspruit Suit, but the southern part occurs on the potassium-poor rock of the Kaap Valley Tonalite (Both Swazian Erathem). The western parts of the distribution are found in Pretoria Group Shale and Quartzite (vaalian). Archean granite plains with granite inselbergs and large granite boulders also occur.

7.3.4 Soils

The Nkambeni substation sites fall within the Ab41 soil group. Soils are of Mispah, Glenrosa and Hutton forms, shallow to deep, sandy or gravelly and well drained. Diabase intrusion are common, giving rise to Hutton soils. Land types Ab, Fa and Ae. (**Figure 12**).

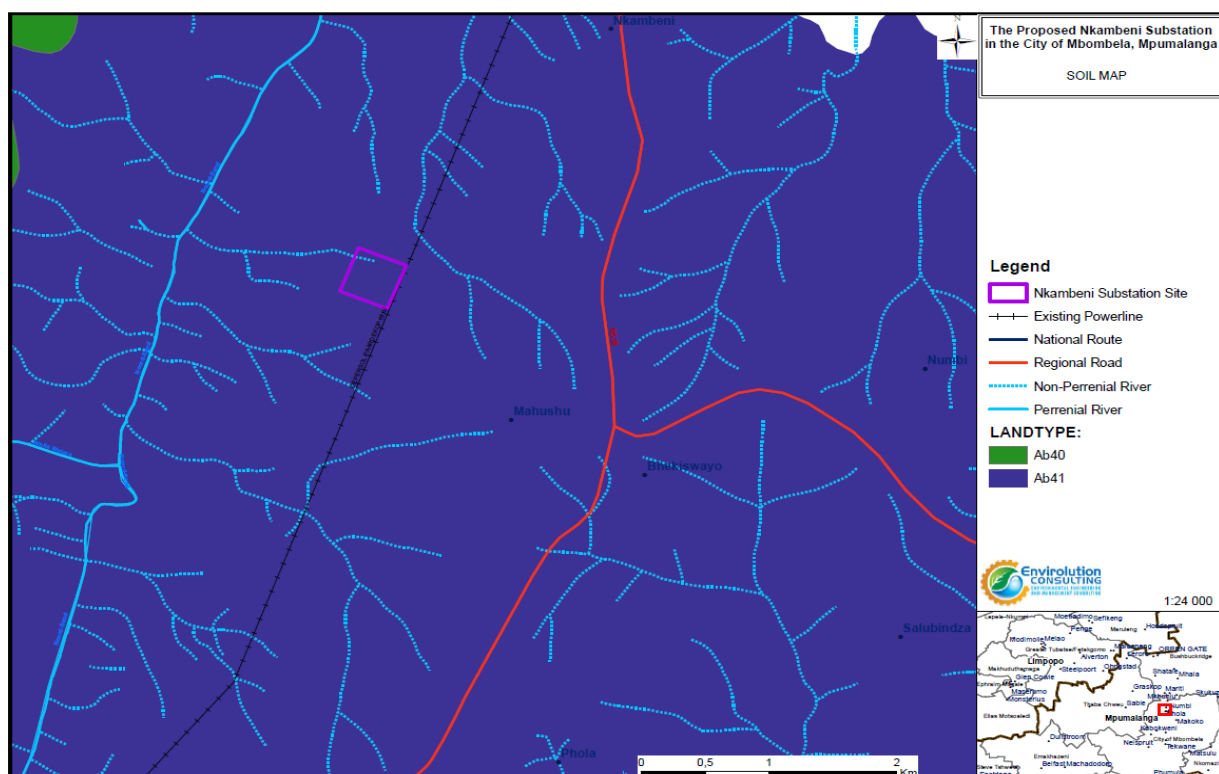


Figure 12: Soil Types Map

7.3.5 Hydrological Setting

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer et al., 2019; Skowno et al., 2019). The project area's 500 m regulated area overlaps with a EN wetland (**Figure 13**).

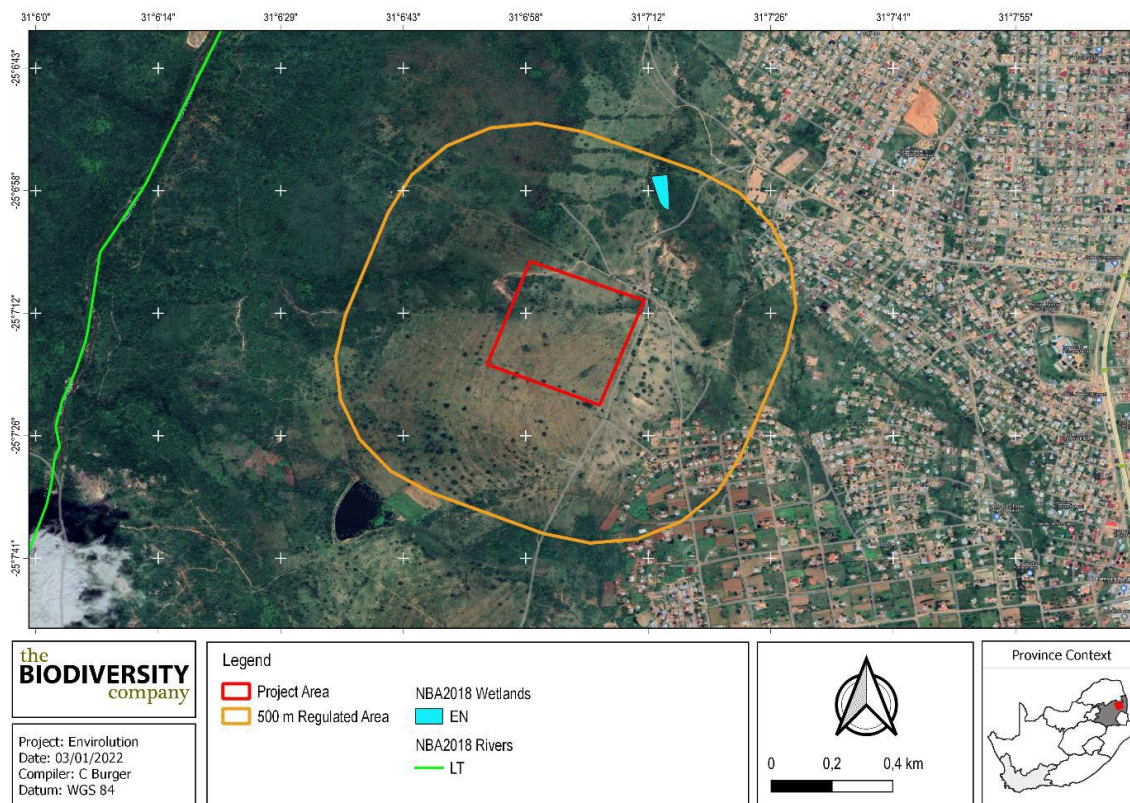


Figure 13: Ecosystem threat status of rivers and wetland ecosystems in the project area

National Freshwater Ecosystem Priority Area Status

The project area's 500 m regulated overlaps with an unclassified FEPA wetland (**Figure 14**)

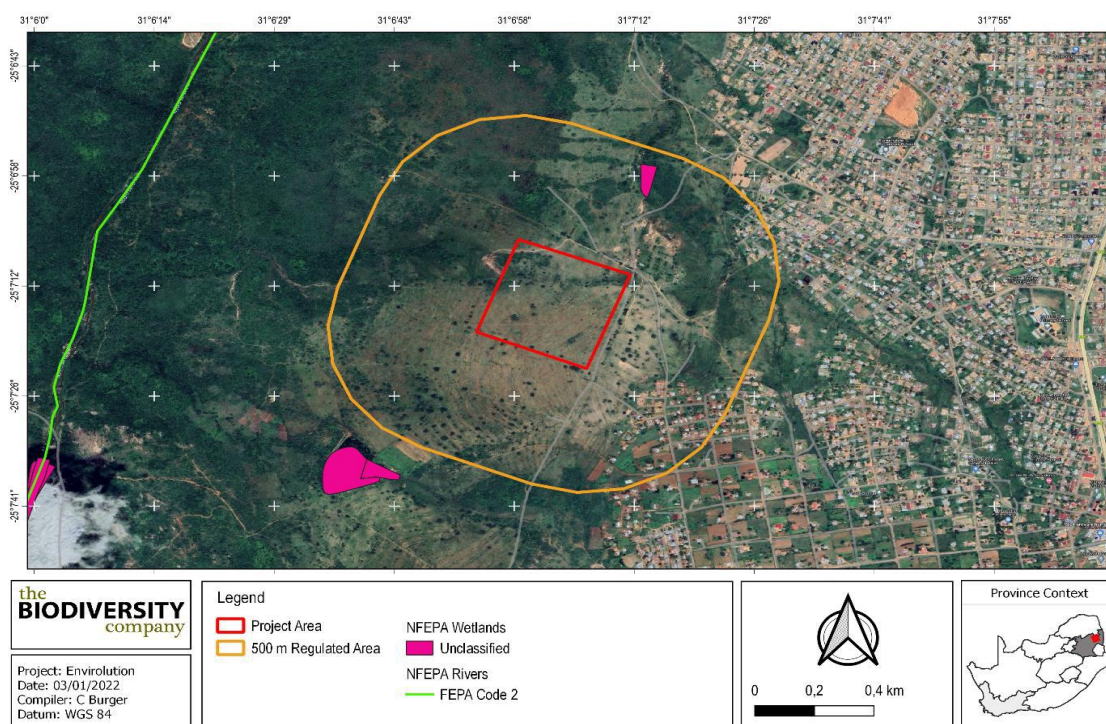


Figure 14: The project area in relation to the National Freshwater Ecosystem Priority Areas.

7.3.6 Wetlands

A wetland was found to be traversing the northern portion of the project area. The ecological integrity, importance and functioning of the wetland areas associated with the project area plays a crucial role as a water resource system and an important habitat for various fauna and flora (**Figure 15**).

Wetland Unit Setting

Channelled valley bottom wetlands are typically found on valley floors with a clearly defined, finite stream channel and lacks floodplain features, referring specifically to meanders. Channelled valley bottom wetlands are known to undergo loss of sediment in cases where the wetlands' slope is steep and the deposition thereof in cases of low relief

Unchannelled valley bottom wetlands are typically found on valley floors where the landscape does not allow high energy flows.

The hillslope seeps are located within slopes and are characterised by colluvial movement of material. These systems are fed by very diffuse sub-surface flows which seep out at very slow rates, ultimately ensuring that no direct surface water connects this wetland with other water courses within the valleys (**Figure 16**)

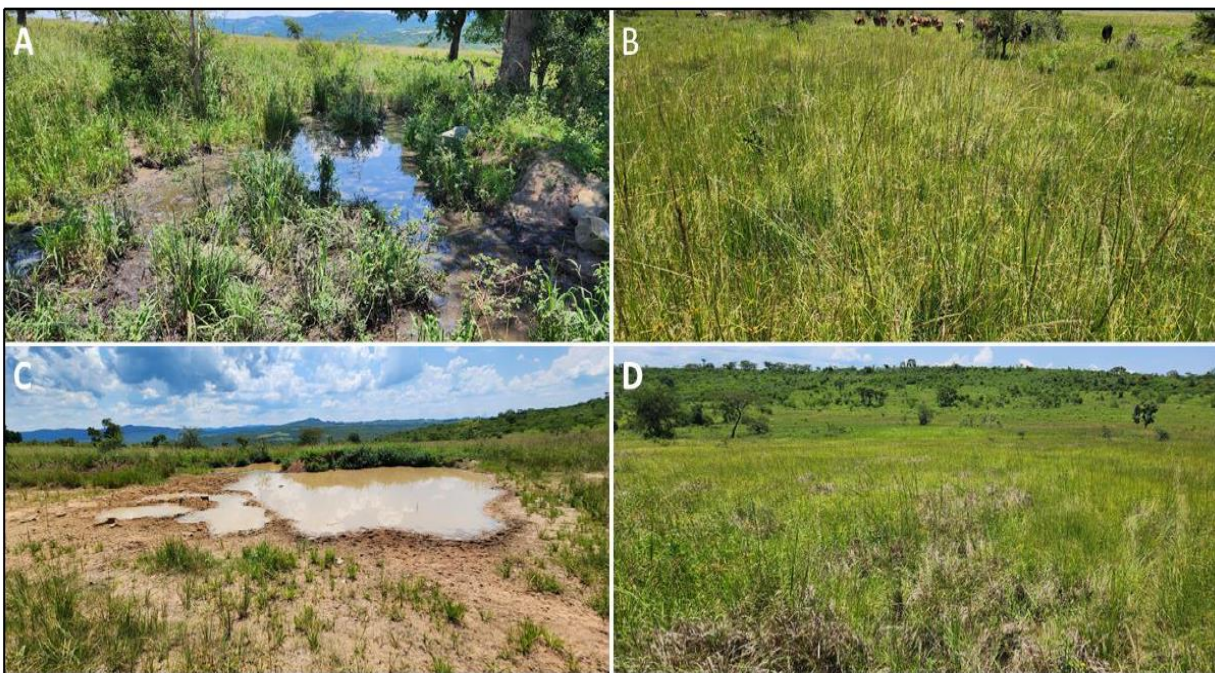


Figure 15: Different wetlands found within the project area.

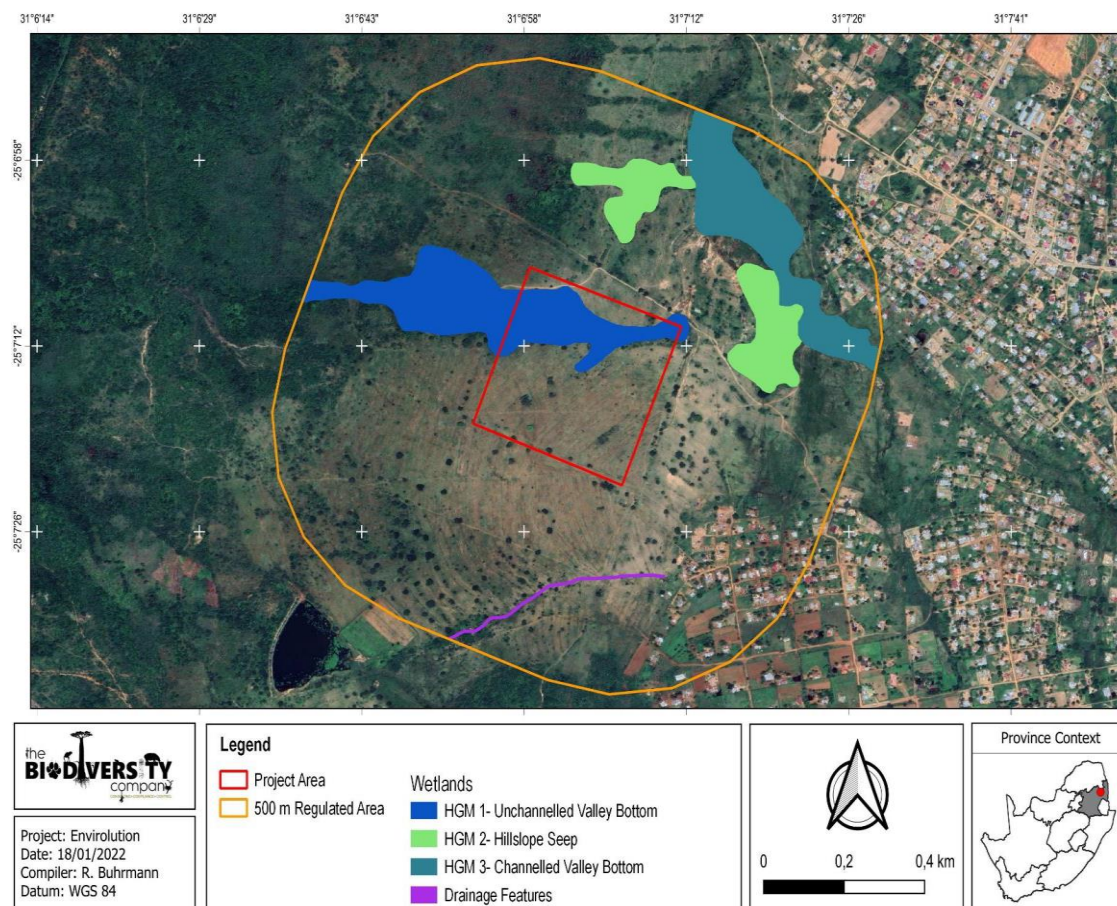


Figure 16: Delineation of all the wetlands HGM units located throughout the 500 m regulated area

Wetland Indicators

Hydromorphic Soils

According to (DWAF, 2005), soils are the most important characteristic of wetlands in order to accurately identify and delineate wetland areas. Three dominant soil forms were identified within the identified wetland, namely the Katspruit and Kroonstad soil forms (Soil Classification Working Group, 2018).

The Katspruit soil form consists of an orthic topsoil on top of a gleyic horizon. The “2210” family group is applicable to this soil form given the grey colours, the firm texture and structure of the soil form and the absence of lime.

The Kroonstad soil form consists of an orthic topsoil on top of an albic horizon, which in turn is underlain by a gleyic horizon. The soil family group identified for the Kroonstad soil form is “1110” due to the gleyed colour of the topsoil, the albic horizon’s grey colours when in a wet condition as well as the non-calcareous nature of the soil.

Hydrophytes

Vegetation plays a considerable role in identifying, classifying and accurately delineating wetlands (DWAF, 2005). During the site visit, various hydrophytic species were identified (including facultative species). Examples include *Cyperus spp.*, and *Schoenoplectus spp.*

Ecological Functional Assessment

The ecosystem services provided by the wetland units identified on site were assessed and rated using the WET-EcoServices method (Kotze *et al.*, 2008). HGM units 1 and 3 scored “Moderately High” ecosystem service scores due to increased nutrients entering these systems through the grazing cattle and agricultural lands. These HGM units consist of large areas with permanently saturated soils with high concentrations of vegetation cover, aiding in the function of sediment trapping and flow attenuation. The average ecosystem service scores for the delineated systems are illustrated in **Figure 17**.

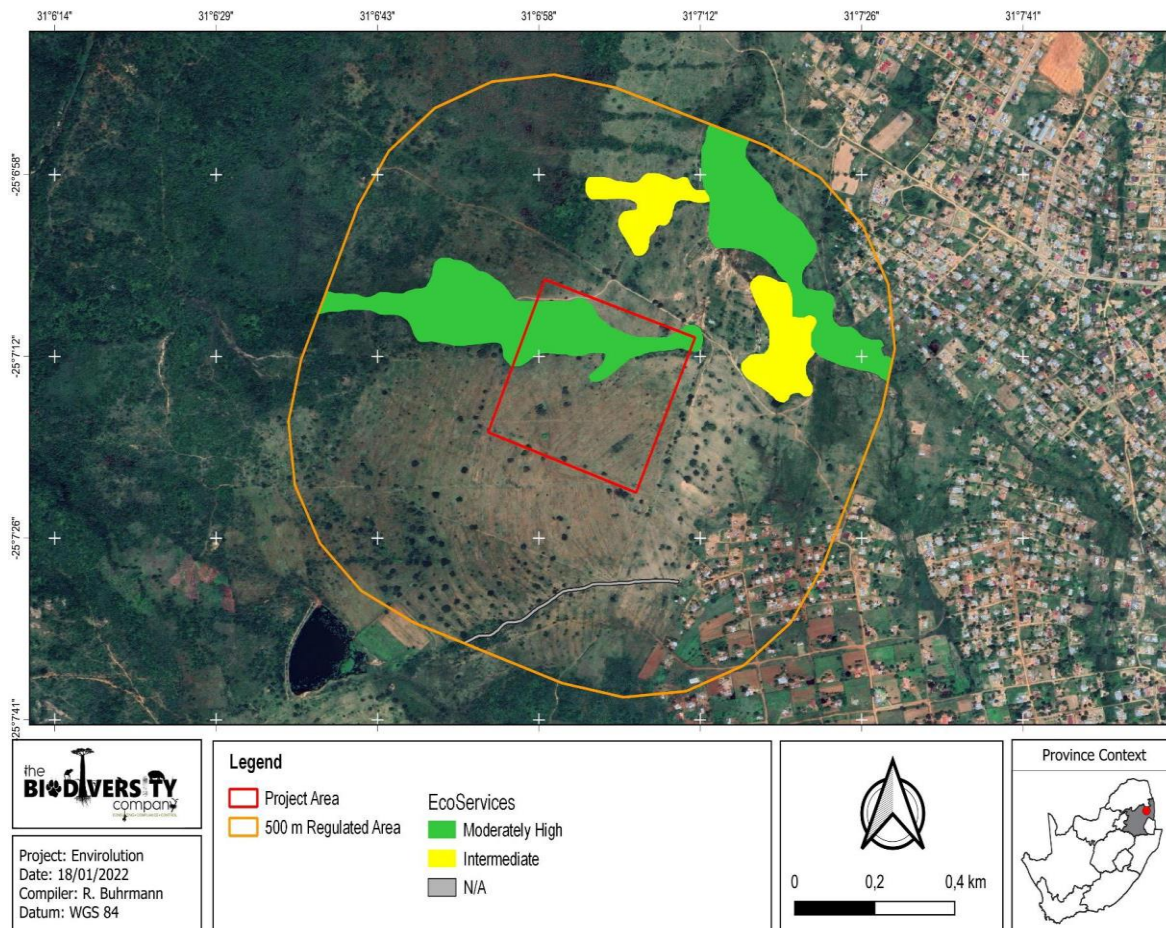


Figure 17: Average ecosystem service scores for the delineated wetland systems

The Ecological Health Assessment

The PES for the assessed HGM units is presented in **Figure 18**. The delineated wetland systems have been scored an overall PES rating of “Largely Modified” (class D). The wetlands were scored “Largely Modified” due to multiple anthropogenic impacts on the systems. These systems are characterised by cultivated lands that are dominated by alien invasive plants and impacted through grazing.

The valley bottom wetlands (HGMs 1 and 3) are located within the more natural areas of the project area but have been modified by erosion as well as the cultivation. The terracing of the surrounding areas has altered the flow

dynamics as well as the vegetation cover within the HGM units. HGM 2 also scored a “Largely Modified” rating since the soil and vegetation of the seep has been completely transformed into grassland through agricultural activities. The seep is also modified through the invasion of invasive species.

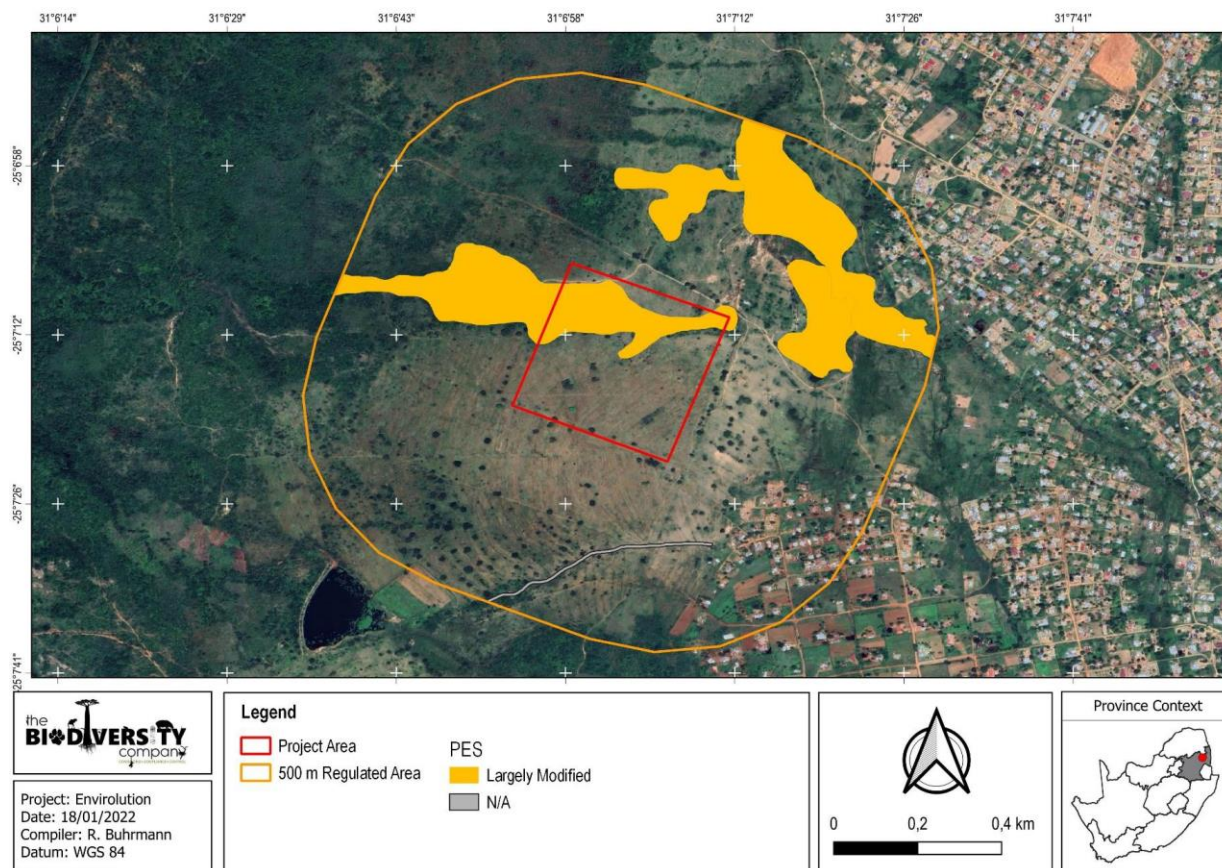


Figure 18: Overall present ecological state of delineated wetlands

The Importance & Sensitivity Assessment

Various components pertaining to the protection status of a wetland is considered for the IS, including Strategic Water Source Areas (SWSA), the NFEPA wet veg protection status and the protection status of the wetland itself considering the NBA wetland data set. The IS for all the HGM units have been calculated to be “Moderate”.

Buffer Requirements

According to Ezemvelo (2013) a minimum buffer size of 30 m is required for wetlands within the province with 200 m to 600 m buffer sizes required from wetlands where Red Data species have been identified. It is worth noting that the scientific buffer calculation (Macfarlane et al., 2014) was used to determine the size of the buffer zones relevant to the proposed sub-station. The model shows that the largest risk (High) posed by the project during the construction phase is that of “Increased sediment inputs and turbidity”. The operational phase has Very High risks for the “Alteration of patterns of flows (increased flood peaks)”, and medium risk for the “Alteration of flow volumes”. The buffer size for the sub-station was determined to be 15 m (**Figure 19**)

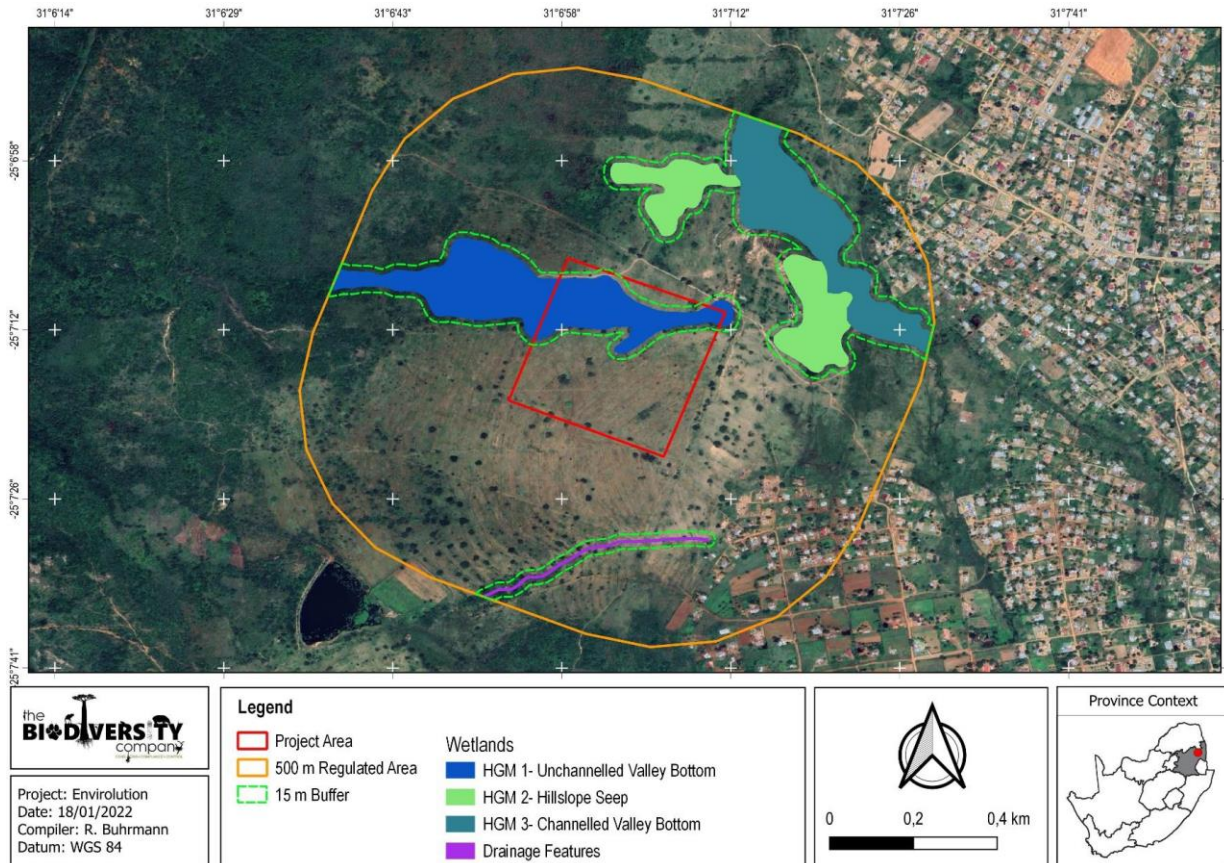


Figure 19: Proposed wetland buffers for the substation

Wetland Risk Assessment

The proposed project is for the construction and operation of a new substation. The location of the substation will encroach within a delineated unchannelled valley bottom wetland, resulting in direct impacts and the expected loss of wetland (**Figure 20**). Approximately 3.898 ha of unchannelled valley bottom wetland would be lost.

For this assessment, the specialist was provided with the project area but not the exact areas to be developed, nor any access routes. The specialist focussed on the wetlands close to the proposed project area. It is assumed that the proposed substation will not be able to avoid the delineated wetlands and thus, the first step in the mitigation hierarchy (avoidance) will not be a viable option. Therefore, emphasis is placed in minimising impacts by means of mitigation implementation of the recommended buffer zones for the identified wetland.

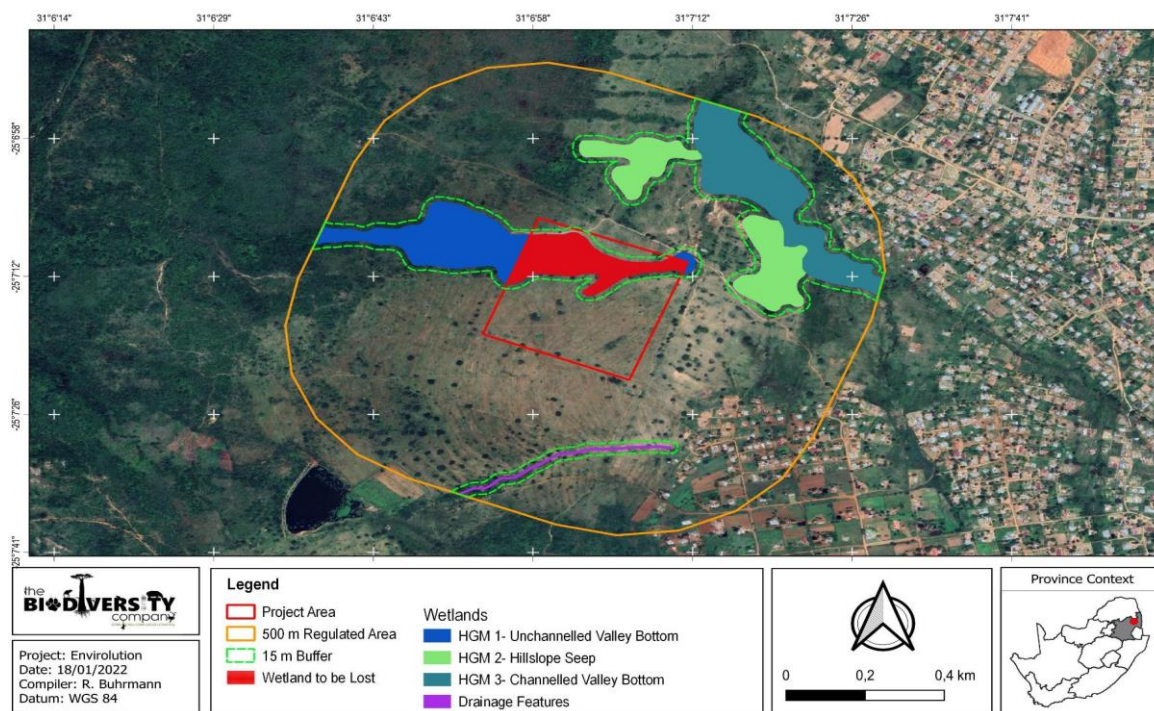


Figure 20: location of the wetland to be lost within the project area.

7.3.7 Regional Vegetation

The project area is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa. Major macroclimatic traits that characterise the Savanna biome include: Seasonal precipitation; and (Sub)tropical thermal regime with no or usually low incidence of frost. On a fine-scale vegetation type, the project area overlaps with the Legogote Sour Bushveld vegetation type (Figure 21).

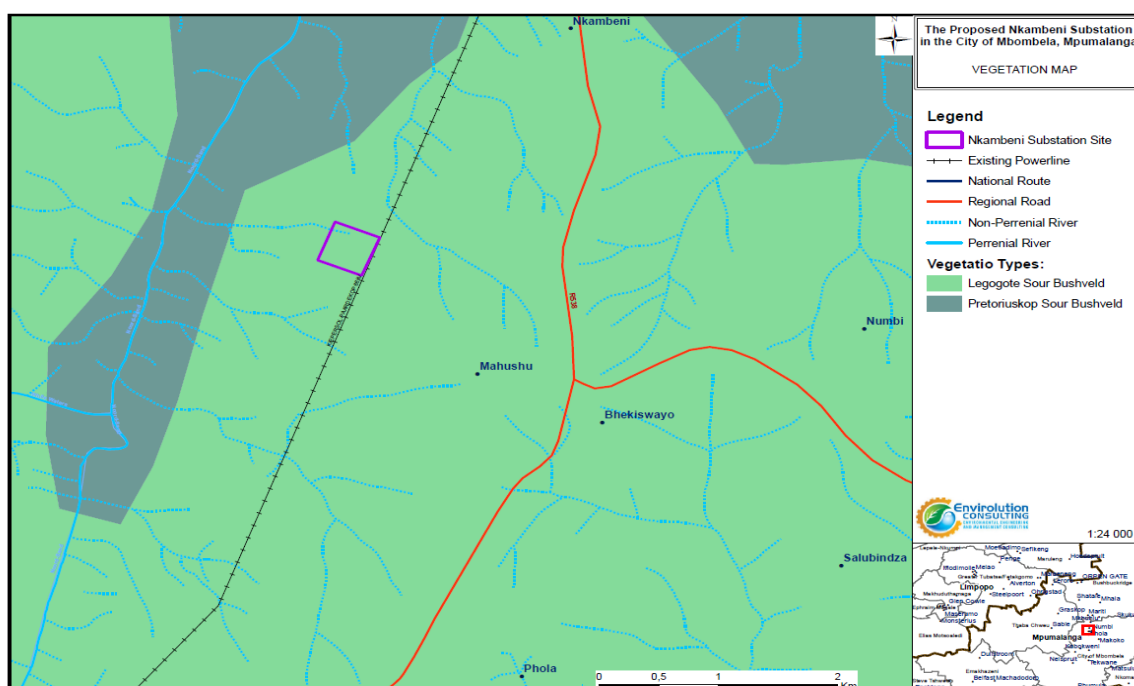


Figure 21: Map illustrating the vegetation type associated with the project area.

Legogote Sour Bushveld

This vegetation type occurs on gently to moderately sloping upper pediment slopes with dense woodland including many medium to large shrubs often dominated by *Parinari curatellifolia* and *Bauhinia galpinii* with *Hyperthelia dissoluta* and *Panicum maximum* in the undergrowth. Short thicket dominated by *Senegalia ataxacantha* occurs on less rocky sites (Mucina & Rutherford, 2006). Exposed granite outcrops have low vegetation cover, typically with *Englerophytum magalismontanum*, *Aloe petricola* and *Myrothamnus flabellifolia* (Mucina & Rutherford, 2006). This vegetation type occurs in the Mpumalanga and Limpopo Provinces from Mariepskop in the north through White River to the Nelspruit area extending westwards up the valleys of the Crocodile, Elands and Houtbosloop Rivers and terminating in the south in the Barberton area (Mucina & Rutherford, 2006).

Important Plant Taxa

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

The following species are important in the **Legogote Sour Bushveld** vegetation type (Mucina & Rutherford, 2006):

Tall Trees: *Pterocarpus angolensis* (d), *Sclerocarya birrea* subsp. *caffra* (d).

Small Trees: *Vachellia davyi* (d), *V. sieberiana* var. *woodii* (d), *Combretum zeyheri* (d), *Erythrina latissima* (d), *Parinari curatellifolia* (d), *Terminalia sericea* (d), *Trichilia emetica* (d), *Vernonia amygdalina* (d), *Senegalia caffra*, *Antidesma venosum*, *Erythroxylum emarginatum*, *Faurea rochetiana*, *F. saligna*, *Ficus burkei*, *F. glumosa*, *F. ingens*, *F. petersii*, *Heteropyxis natalensis*, *Peltophorum africanum*, *Piliostigma thonningii*, *Pterocarpus rotundifolius*, *Schotia brachypetala*.

Succulent Tree: *Euphorbia ingens*.

Tall Shrubs: *Diospyros lycioides* subsp. *sericea*, *Erythroxylum delagoense*, *Olea europaea* subsp. *africana*, *Pachystigma macrocalyx*, *Pseudarthria hookeri* var. *hookeri*, *Searsia pentheri*.

Low Shrubs: *Diospyros galpinii* (d), *Flemingia grahamiana* (d), *Agathisanthemum bojeri*, *Eriosema psoraleoides*, *Gymnosporia heterophylla*, *Hemizygia punctata*, *Indigofera filipes*, *Myrothamnus flabellifolius*, *Searsia rogersii*.

Succulent Shrubs: *Aloe petricola*, *Euphorbia vandermerwei*, *Huernia kirkii*.

Woody Climbers: *Senegalia ataxacantha* (d), *Bauhinia galpinii* (d), *Helinus integrifolius*, *Sphedamnocarpus pruriens* subsp. *pruriens*.

Graminoids: *Bothriochloa bladhii* (d), *Cymbopogon caesius* (d), *C. nardus* (d), *Hyparrhenia cymbaria* (d), *H. poecilotricha* (d), *Hyperthelia dissoluta* (d), *Panicum maximum* (d), *Andropogon schirensis*, *Paspalum scrobiculatum*, *Schizachyrium sanguineum*.

Herbs: *Gerbera ambigua*, *G. viridifolia*, *Hemizygia persimilis*, *Hibiscus sidiformis*, *Ocimum gratissimum*, *Waltheria indica*.

Succulent herbs: *Orbea carnos* subsp. *carnosa*, *Stapelia gigantea*.

Geophytic Herbs: *Gladiolus hollandii*, *Hypoxis rigidula*.

Endemic Taxon Succulent Herb: *Aloe simii*.

Conservation Status of the Vegetation Type

This vegetation type is classified as Endangered (EN). The national target for conservation protection for both these vegetation types is 19%, but only 2% is statutorily conserved mainly in the Bosbokrand and Barberton Nature Reserves and at least a further 2% is conserved in private reserves including the Mbesan and Kaapsehoop Reserves and Mondi Cycad Reserve. It has been greatly transformed (50%), mainly by plantations and also by cultivated areas and urban development (Mucina and Rutherford 2006).

During the field assessment two habitat units were identified and included degraded bushveld and wetland habitat. No flora SCC species were observed. However, *Sclerocarya birrea*, was found within the project area; this species is protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA).

7.3.8 Terrestrial Flora

Two habitat units were identified and included degraded bushveld and wetland habitat. No flora SCC species were observed. However, *Sclerocarya birrea*, was found within the project area; this species is protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA).

Degraded Bushveld

The majority of the project area comprised of degraded bushveld habitat (**Figure 22**). This habitat is defined as areas that have been impacted on by historic land clearing, mismanagement and land use. Historical vegetation clearing for what is assumed cultivation/agricultural practices has led to an absence of large woody plants and an area dominated by grasses and/or an infestation of alien and invasive vegetation, with current grazing activities by livestock also taking place within this area. The dominant flora species found across this habitat unit includes *Parinari curatellifolia*, *Sclerocarya birrea*, *Sterculia murex*, *Ficus glumosa*, *Albizia versicolor*, *Peltophorum africanum*, *Wahlenbergia undulata*, *Ceratotheca triloba*, *Thunbergia atroplicifolia*, *Ocimum Americanum*, *Aristida congesta*, *Paspalum dilatatum* and *Sporobolus pyramidalis*

Additionally, several alien and invasive species such as *Verbena brasiliensis* (NEMBA Category 1b), *Erigeron bonariensis*, and *Lantana camara* (NEMBA Category 1b) were observed across the project area.

Since the project area is situated in close proximity to the Nkambeni township/village, the area is exposed to constant anthropogenic related activities such as harvesting of woody material, harvesting of medicinal plant species, and utilisation of the area for grazing of livestock.

This habitat isn't entirely transformed but in a constant disturbed state, as it can't recover to a more natural state due to ongoing disturbances and impacts received from grazing and mismanagement. This area is considered to have a low sensitivity, as it may be used as a movement corridor.



Figure 22: the degraded bushveld habitat associated with the project area

The wetland habitat is discussed in Section 7.3.6 above.

7.3.9 Habitat Survey and Site Ecological Importance

The main habitat types identified across the project area were initially identified and pre-delineated largely based on aerial imagery from 2022. These habitat types were then refined based on the field coverage and data collected during the survey.

The delineated habitat type has been allocated a sensitivity category, or SEI, and this breakdown is presented in **Table 9** below. The sensitivities of each of the habitat types delineated within the project area are mapped in (**Figure 23**)

Table 8: Site Ecological Importance assessment summary

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Degraded Bushveld	Medium - > 50% of receptor contains natural habitat with potential to support SCC.	Low - Several minor and major current negative ecological impacts.	Low	Medium	Low
Wetlands	Medium - > 50% of receptor contains natural habitat with potential to support SCC.	Medium - Mostly minor current negative ecological impacts with some major impacts.	Medium	Medium	Medium

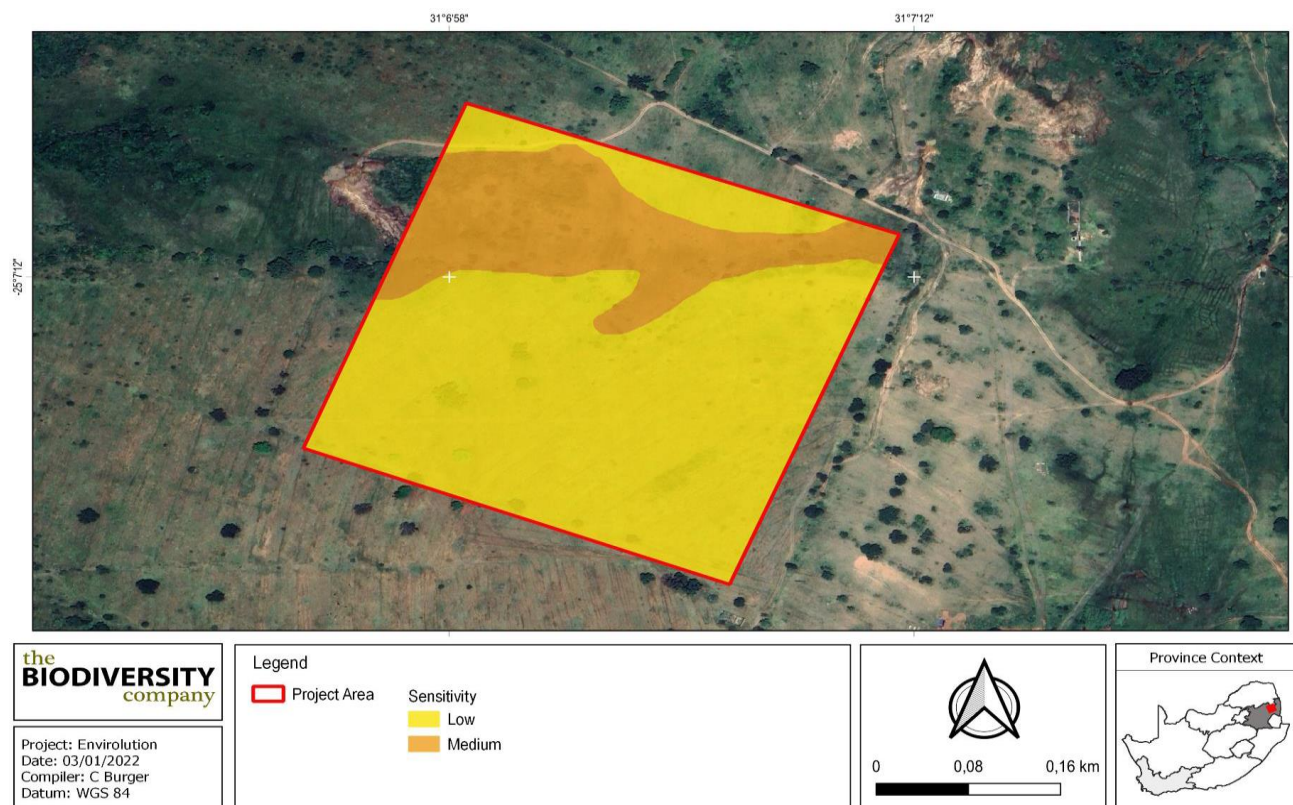


Figure 23: Map illustrating the Site Ecological Importance of the project area

7.3.10 Terrestrial Fauna

No mammal or amphibian species were observed across the project area as the faunal activity was low during the site visit, while one reptile species, *Agama atra* (Southern Rock Agama), and twelve (12) avifaunal species were observed. There is however the possibility of some common mammal and amphibian species being present due to suitable habitat in the area. Certain amphibian species are secretive and longer-term surveys are required in order to ensure adequate sampling. Refer to **Appendix D1** for photographs of the fauna observed.

Table 9: The fauna species recorded during the field survey

Species	Common Name	Conservation Status	
		SANBI (2022)	IUCN (2021)
Avifauna			
<i>Acridotheres tristis</i>	Myna, Common	Unlisted	LC
<i>Anthus cinnamomeus</i>	Pipit, African	Unlisted	LC
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC
<i>Colius striatus</i>	Mousebird, Speckled	Unlisted	LC
<i>Euplectes axillaris</i>	Widowbird, Fan-tailed	Unlisted	LC
<i>Hirundo rustica</i>	Swallow, Barn	Unlisted	LC
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC
<i>Lonchura cucullata</i>	Mannikin, Bronze	Unlisted	LC
<i>Macronyx croceus</i>	Longclaw, Yellow-throated	Unlisted	LC
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC
<i>Pycnonotus tricolor</i>	Bulbul, Dark-capped	Unlisted	Unlisted
<i>Vanellus senegallus</i>	Lapwing, African Wattled	Unlisted	LC
Reptiles			
<i>Agama atra</i>	Southern Rock Agama	LC	LC

7.3.11 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 340 bird species have the potential to occur in the vicinity of the project area. Of the potential bird species, eighteen (18) species are listed as SCC either on a regional or global scale (**Table 10**). Eleven of the species had a low likelihood of occurrence based on the lack of suitable habitat and the proximity to urbanization.

Table 10: List of bird species of regional or global conservation importance that are expected to occur in close vicinity to the project area

Species	Common name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Moderate
<i>Aquila rapax</i>	Eagle, Tawny	EN	VU	Low
<i>Bucorvus leadbeateri</i>	Ground-hornbill, Southern	EN	VU	Low
<i>Ciconia nigra</i>	Stork, Black	VU	LC	Low
<i>Coracias garrulus</i>	Roller, European	NT	LC	Moderate
<i>Ephippiorhynchus senegalensis</i>	Stork, Saddle-billed	EN	LC	Low
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	Moderate
<i>Gyps africanus</i>	Vulture, White-backed	CR	CR	Low
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Low
<i>Leptoptilos crumenifer</i>	Marabou	NT	LC	Low
<i>Mycteria ibis</i>	Stork, Yellow-billed	EN	LC	Low
<i>Necrosyrtes monachus</i>	Vulture, Hooded	CR	CR	Low
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	EN	Moderate
<i>Spermestes fringilloides</i>	Mannikin, Magpie	NT	LC	Low
<i>Stephanoaetus coronatus</i>	Eagle, African Crowned	VU	NT	Moderate
<i>Terathopius ecaudatus</i>	Bateleur, Bateleur	EN	EN	Low
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	EN	EN	Moderate
<i>Trigonoceps occipitalis</i>	Vulture, White-headed	CR	CR	Moderate

7.3.12 Terrestrial Biodiversity

The terrestrial biodiversity theme sensitivity as indicated in the screening report (compiled by the National Web based Environmental Screening Tool) was derived to be 'Very High' (**Figure 24**), mainly due to the fact that the project area lies within a Vulnerable Ecosystem and Strategic Water Source Area.

Legend:

- Very High
- High
- Medium
- Low

0 0.125 0.25 0.5 Kilometers

Source: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NOAA, (c) OpenStreetMap contributors, and the GIS User Community

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
x			

Sensitivity	Feature(s)
Very High	Strategic Water Source Areas
Very High	Vulnerable ecosystem

The completion of the terrestrial desktop and field studies disputes the 'Very High' sensitivity presented by the screening report. As discussed above, the project area has largely been impacted upon by current and historic anthropogenic activities and as such is assigned a sensitivity rating of 'Medium' and 'Low'.

The screening report classified the plant species theme sensitivity as 'Medium', with the possibility of the following Medium sensitivity species being present; *Woodia singularis* (Rare). The likelihood of occurrence for the species is considered to be low. Following the findings of the field survey, the plant species theme should retain its "medium" sensitivity, based on the likely presence of certain protected species, and the animal species theme (from a mammal, herpetofauna and avifaunal perspective) should be assigned a "Low" sensitivity due to the absence of certain SCC species and lack of suitable habitat across the project area.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

7.3.13 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset, the proposed project area overlaps with a EN ecosystem (**Figure 25**).

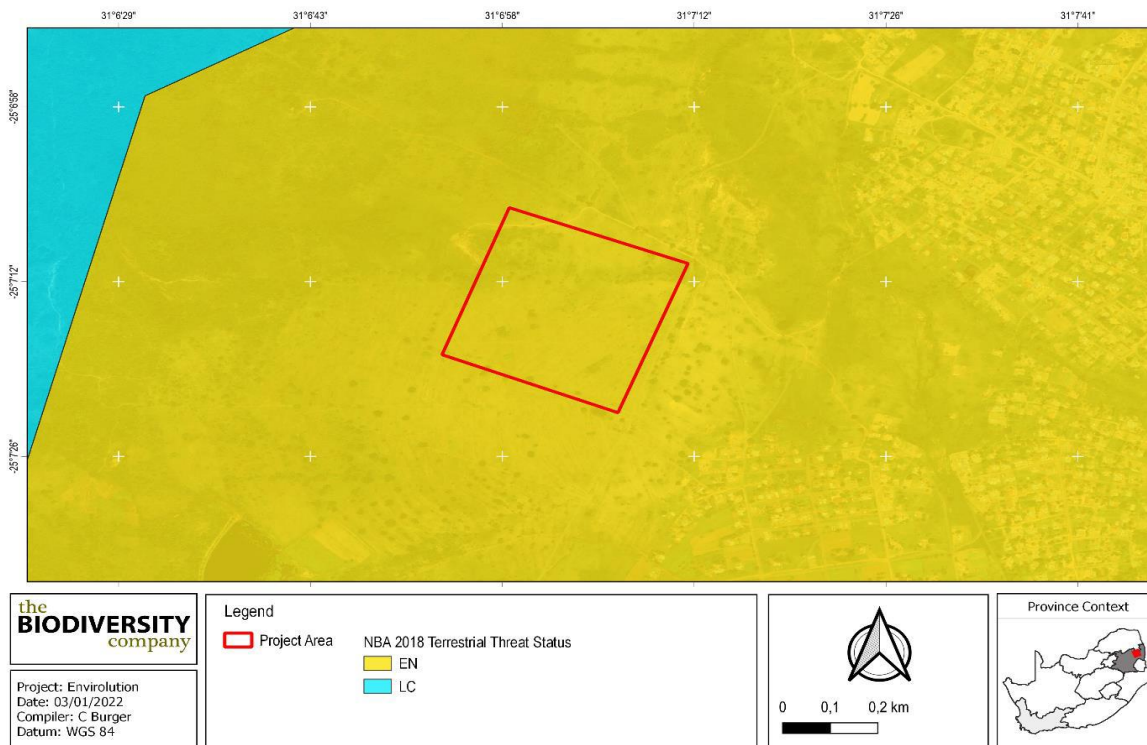


Figure 25: Map illustrating the ecosystem threat status associated with the project area

7.3.14 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with a Poorly Protected ecosystem (**Figure 26**).



Figure 26: Map illustrating the ecosystem protection level associated with the project area

7.3.15 Protected Areas

According to the spatial data for SAPAD (2022) and SACAD (2022), the project area is located 6 km west of the Kruger National Park (**Figure 27**).

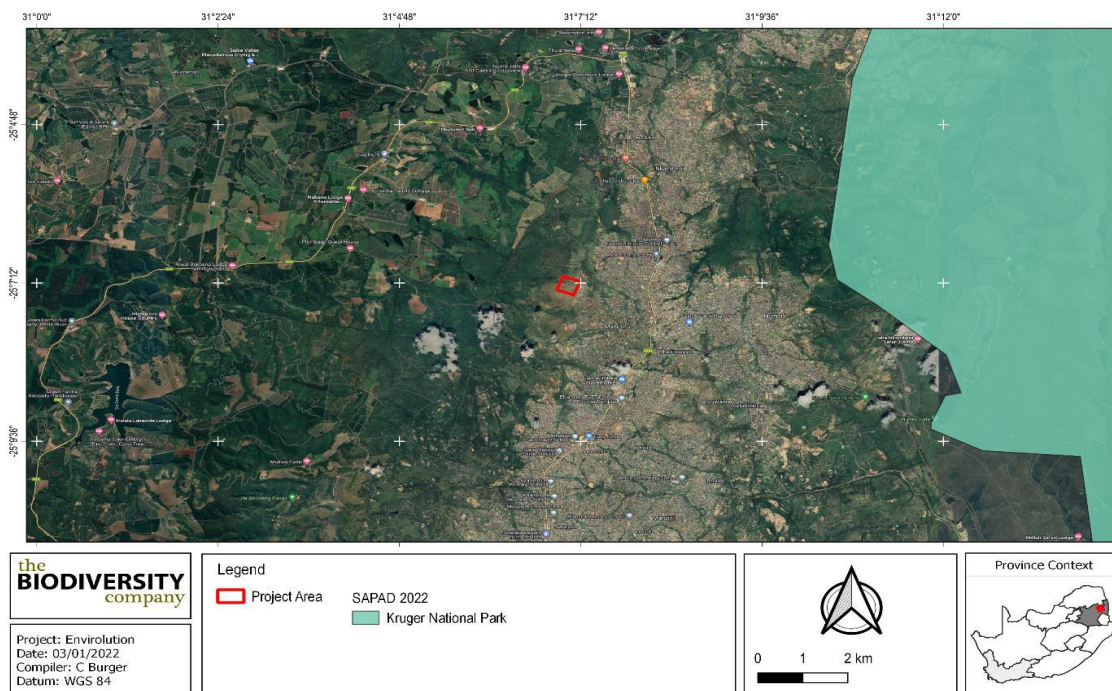


Figure 27: The project area in relation to the nearest protected areas

Mpumalanga Protected Areas Expansion Strategies

The Mpumalanga Protected Area Expansion Strategy (MPAES, 2013), commissioned by the MTPA, serves to function as a provincial framework for an integrated, co-ordinated and uniform approach in the expansion and consolidation of the Provincial Protected Areas (PAs), in line with the requirements of the NPAES.

The priority areas for PA Expansion within Mpumalanga were spatially established based on the premise that the primary goal of these areas is to protect biodiversity targets. Several biodiversity data sources were used for the assessment, namely the: Threatened Ecosystems, MBCP Terrestrial Assessment, MBCP Aquatic Assessment, MBCP Irreplaceability, C-plan Irreplaceability, and the National Spatial Biodiversity Assessment Priority areas. A combination of all these were used, together with the spatial priorities established within the NPAES, to establish the spatial priority areas that will guide the NPAES over the next 20 years as reflected below. **Figure 28** shows a Provincially Protected Area Expansion Priority directly west of the site.

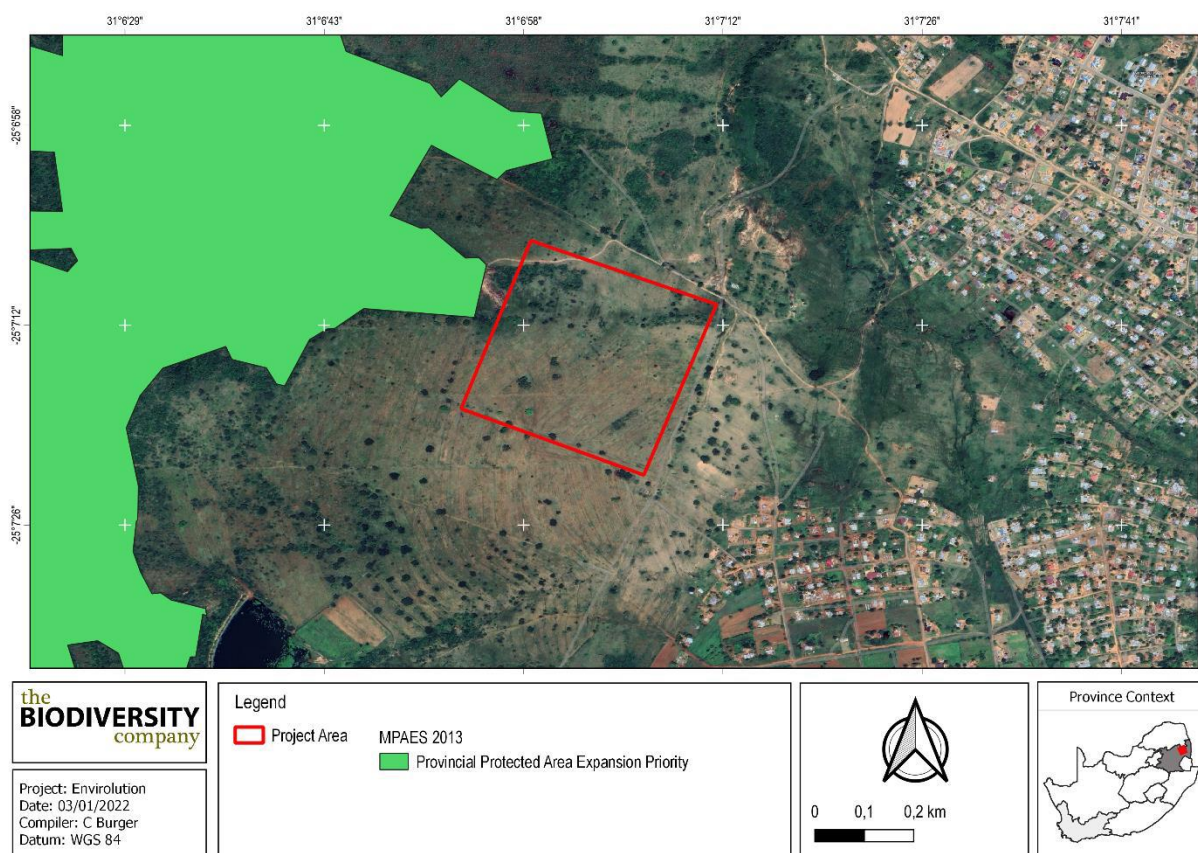


Figure 28: The project area in relation to the Mpumalanga Protected Areas Expansion Strategy areas

7.3.16 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2017 (NPAES) 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, 2017). The project area does not overlap with any NPAES areas but is located adjacent to a Priority Focus Area (**Figure 29**).

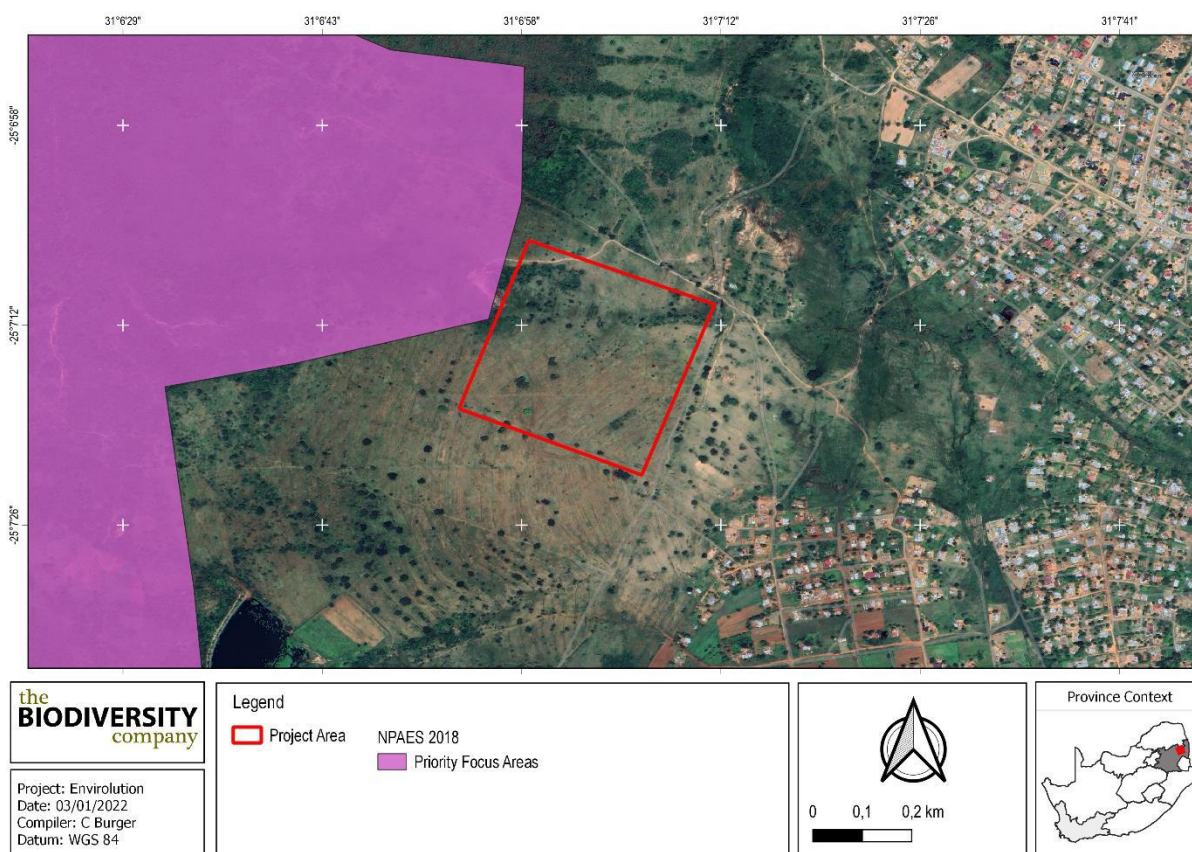


Figure 29: The project area in relation to the National Protected Area Expansion Strategy

7.3.17 Mpumalanga Biodiversity Sector Plan

The key output of this systematic biodiversity plan is a map of biodiversity priority areas (MTPA, 2014). The MBSP CBA map delineates Critical Biodiversity Areas, Ecological Support Areas, Other Natural Areas, Protected Areas, and areas that have been irreversibly modified from their natural state (MTPA, 2014). **Figure 30** shows the project area overlaps with an Ecological Support Area.

CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).

ESAs are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).

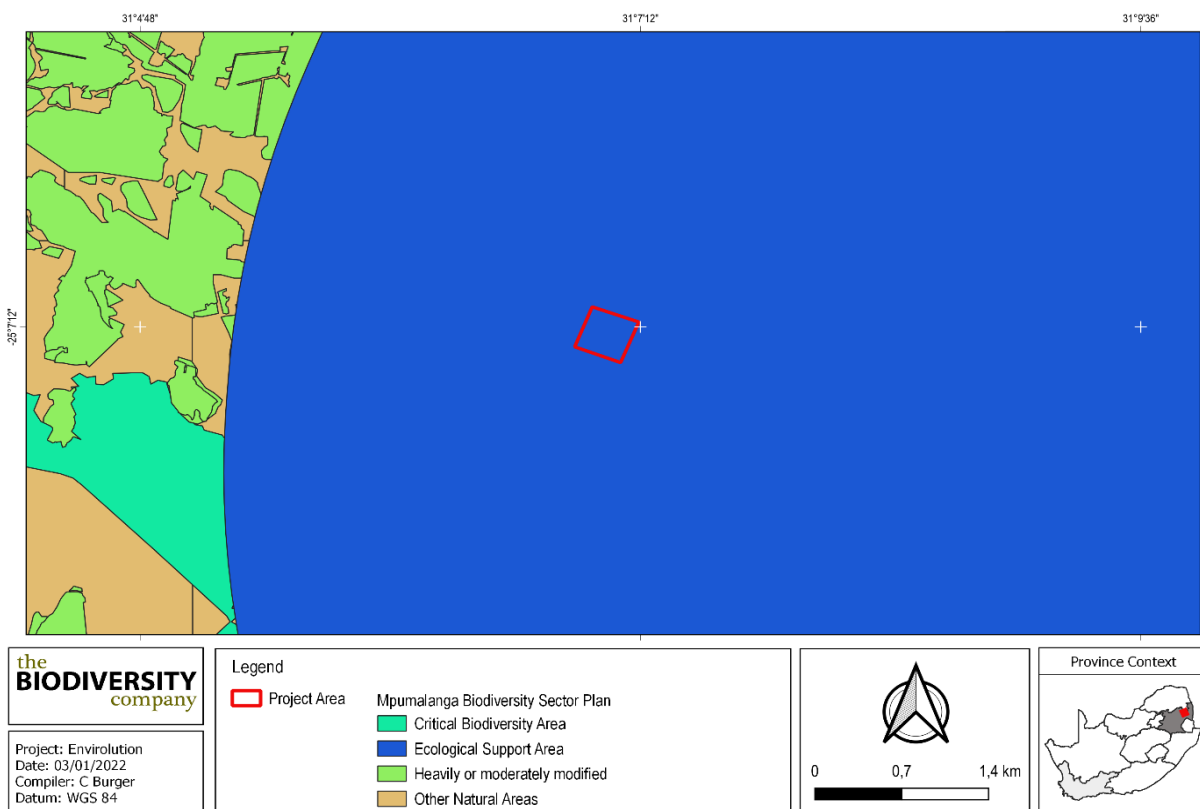


Figure 30: The project area in relation to the Mpumalanga Biodiversity Sector Plan features

7.3.18 Important Bird and Biodiversity Area

Important Bird & Biodiversity Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by Bird Life International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (Birdlife, 2017). The project area is situated 6 km from the nearest IBA (**Figure 31**).

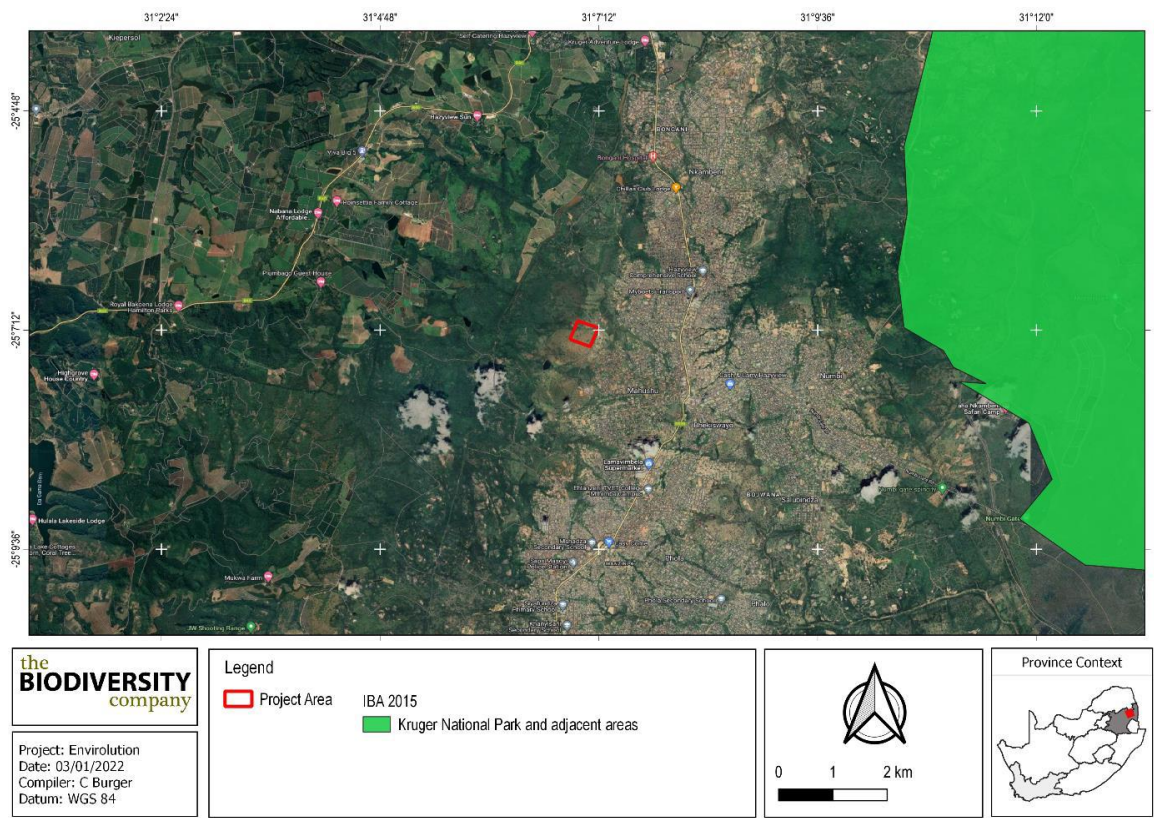


Figure 31: The project area in relation to the Kruger National Park IBA

7.4 Human and cultural Environment

7.4.1 Heritage Features

Archaeological and Cultural Heritage Sensitivity has been rated as being a medium sensitivity for the proposed area. In terms of the Heritage Impact Assessment done for the original EIA, 2 possible graves were identified in the 150m x 150m footprint area that was initially applied for. (See **Figure 32**).

The proposed area considered has previously been utilised for agricultural activities including cultivation and it is highly unlikely that any other heritage resources remained. A new Heritage study was commissioned to determine the presence of heritage sites of importance in the extended area.



Figure 32: Location of known heritage sites and features in relation to the project area

Findings of Phase 1 Heritage Impact Assessment conducted in 2018 and updated in 2022

The field assessment identified some sites & features of cultural heritage (archaeological/historical) origin in the study area. Most of these are however individual scatters of material (pottery, grinding stones) and of very low cultural heritage (archaeological and/or historical) significance. There is however a few with higher significance (APAC, 2022).

The area has been ploughed over the years, and as a result if any sites did occur here it would have been extensively disturbed or destroyed. Individual pieces and small scatters of undecorated pottery were noticed across the area, while out of context upper grinding stones were also identified. This is of course evidence of earlier settlement in the area that has all but been destroyed. Traces of this settlement can however still be present underground. Pieces of building material (cement/concrete) found is also further evidence of this, while the communal grinding hollows found on the rocky outcrop in the area substantiates this (APAC, 2022).

The proposed site contains a fairly dense scatter of undecorated pottery, metal, porcelain and glass objects, located on an open area that could possibly denote an old refuse midden close to homestead (no physical evidence for the homestead remains). What makes this site very significant however is the scatter of metal slag (evidence for metal smelting and working). A fragment of a clay blow pipe (used in the metal smelting furnaces) was also found on the site. The age of these remains possibly date to the Late Iron Age (LIA), with some later historical settlement on the site as well. A stone cairn found close by (initially thought to be a possible grave is more likely a granary platform. Similar open patches were noticed in the study area, but very little material was found at these locations except for one or two pieces of pottery. It is possible that these open areas could be evidence of earlier homesteads that has been destroyed by recent farming activities (APAC, 2022)



Figure 33: Pottery, metal, porcelain and glass at the proposed site



Figure 34: The stone cairn at the proposed site

7.4.2 Palaeontological Sensitivity

This area falls on the Nelspruit Suite, with a Very Low Palaeontological Sensitivity, therefore it is a No-Study. The likelihood of finding fossils is zero.

Refer to **Appendix D2** for the comprehensive Heritage Impact Assessment and Paleontological site verification

7.5 Socio-Economic Features

7.5.1 Municipal Regional Setting

Mpumalanga, the second-smallest province in South Africa after Gauteng, is located in the north-eastern part of the country, bordering Swaziland and Mozambique to the east. It also borders Limpopo, Gauteng, Free State and KwaZulu-Natal within South Africa. It covers an area of 76 495km² and has a population of 4 335 964, making it the sixth most populous in the country. It is situated mainly on the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. In the north-east, it rises towards mountain peaks and terminates in an immense escarpment. In some places, this escarpment plunges hundreds of metres down to the low-lying area known as the Lowveld. Mpumalanga is divided into three district municipalities, which are further subdivided into 17 local municipalities.

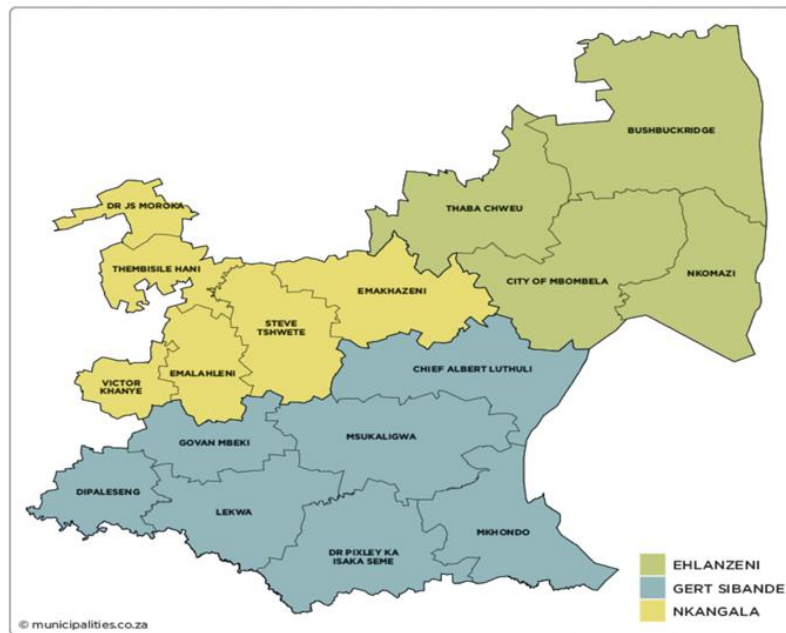


Figure 35: Regional Setting

The broader project site for the establishment of the Nkambeni Substation and associated infrastructure is located in the City of Mbombela Local Municipality (MLM). The MLM is a Category B municipality situated in the Mpumalanga Province and forms part of the Ehlanzeni District. It is one of the four municipalities in the district, making up almost a third of its geographical area. It was established by the amalgamation of the Mbombela and Umjindi Local Municipalities in August 2016. Mbombela (previously Nelspruit) is the capital of the province, and covers an area of approximately 7 152km² comprising of the following Cities/Towns: Barberton, Emoyeni, Entokozweni, Hazyview, Kaapschehoop, Kabokweni, Kanyamazane, Luphisi, Matsulu, Mbombela, Mpakeni, Msogwaba, Ngodwana, Skukuza, Tekwane and White River. In 2016 the estimated population of the City of Mbombela LM was approximately 695 913 and the closest town to the Proposed Nkambeni Substation is Hazyview, which is located approximately 8 km to the north-east.

7.5.2 Unemployment profile

From the below table, it can be deduced that unemployment within the Mbombela municipal area has increased by 4% between 2016 and 2020. The unemployment rate (expanded definition) thus stood at 35.3% during 2020 from 31.3% in 2016. It can also be observed that females unemployment rate within the municipal area increased to 39.1% in 2020 from 35.2% recorded in 2016, an increase of 3.9%. This is largely due the fact that the economy has not been performing very well within the entire country as a result of a number of factors including lack of sufficient investment as well as the economic effects of COVID-19 pandemic which led to a series of lockdowns and subsequent closure of business operations. This resulted in detrimental economic consequences and businesses were forced to lay off their employees. Youth unemployment is one of the major challenges facing the country. The City of Mbombela is no exception from this time ticking bomb problem. This age group is highly active and constitutes the highest proportion to the City of Mbombela's total population.

During 2016, youth unemployment (expanded definition) for the Municipality stood at 42.9%. In 2020, this number has climbed to 49.3% - an indication of 6.4% increase. This is unsustainable and more concerted efforts needs to be done in order to reverse these figures. The number of jobs that were shed as a result of COVID-19 pandemic disruptions during 2020 are estimated at 21 722. Furthermore, employment level between 2016 and 2020 indicated an average decline of 0.6% per annum.

Table 11: Unemployment rates from 2015 to 2019

	Age	Years	Percentage		
			Total	Male	Female
Unemployment rate (expanded definition)	General (15-65 years)	2016	31.3%	29.8%	35.2%
		2020	35.3%	31.6%	39.1%
	Youth (15-34 years)	2016	42.9%		
		2020	49.3%		

7.5.3 Socio-economic profile

The largest employing economic industries in the municipal area of Mbombela in 2015 were trade (23.7%) which includes tourism, community services (22.9%) and finance (15.3%). During 2020, this trend continued with trade recording 24.9%, community services 22.4% and finance 15.7%, an increase of 1.2% and 0.4% for trade and finance respectively. During this period, the highest decline (1%) was observed in the construction industry which fell from 7% during 2015 to 6% in 2020. This was followed by the manufacturing industry, which saw a decline of 0.5% between 2015 and 2020. An improvement of 0.5% in transport, and 0.7% in agriculture was also witnessed between the same period (2015-2020). Economic sectors that need to be more capacitated include amongst others utilities, mining and transport in order to generate the targeted jobs envisaged in the City of Mbombela Vision 2030.

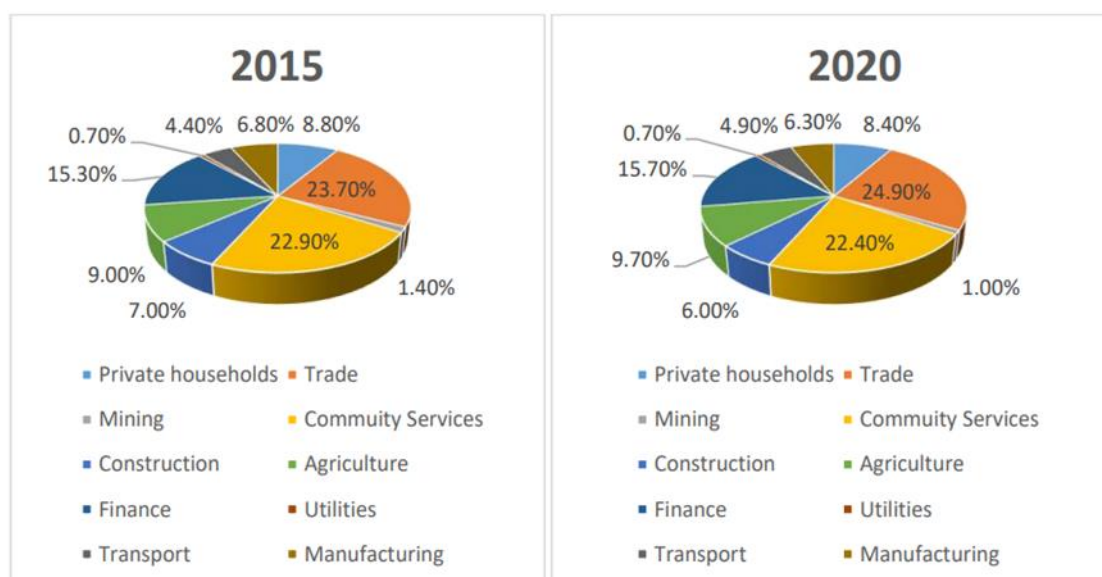


Figure 36: Employment by Industry (2015 and 2020)

7.5.3 Educational Profile

According to the Mpumalanga Department of Education, the Mbombela municipal area has 151 public primary schools, 59 public secondary schools, 25 independent (private) schools and 5 tertiary institutions. Comparing the number of educational facilities and the total population of 695 913, it is clear that there is a need for more schools within the Mbombela municipal area. The Municipality must allocate land for educational purposes in terms of its Spatial Development Framework and that should also be linked to the infrastructure master plans for water, roads and electricity.

In terms of the latest StatsSA Community Survey 2016, there was a significant improvement in the number of persons who have completed their Grade 12/Matric within the Mbombela municipal area. In 2011, there were 135 136 people who completed their Grade 12 and this increased to 158 713 in 2016, recording a 17% increase. It is nonetheless imperative to note that during the same period, a dramatic increase was recorded in the number of people who have not been to school coupled with a decrease in the number of people with post matric qualifications. The results thereof indicate an increase by 79 334 in the number of people with no schooling and a 27.4% decline in the number of people in possession of post matric qualifications as depicted in the figure above. (NB: 2011 results based on a combined 2011 municipal boundaries for the former Umjindi and Mbombela Municipalities whilst 2016 results based on 2016 municipal boundary for the newly formed City of Mbombela).

8. ENVIRONMENTAL IMPACT ASSESSMENT

8.1 Impact Assessment Methodology

The following methodology and criteria were used in assessing impacts related to the proposed development.

The following methodology and criteria was used in assessing impacts related to the proposed development.

- The **Nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- The **Extent**, wherein it is indicated whether:
 - 1 is limited to the immediate area or site of development
 - 2 is the local area
 - 3 is regional
 - 4 is national
 - 5 is international
- The **Duration**, wherein it is indicated whether:
 - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - The lifetime of the impact will be of a short duration (2–5 years) - assigned a score of 2;
 - Medium-term (5–15 years) – assigned a score of 3;
 - Long term (> 15 years) - assigned a score of 4; or;
 - Permanent - assigned a score of 5.
- The **Magnitude**, quantified on a scale from 0–10, where a score is assigned:
 - 0 is small and will have no effect on the environment;
 - 2 is minor and will not result in an impact on processes;
 - 4 is low and will cause a slight impact on processes;
 - 6 is moderate and will result in processes continuing but in a modified way;
 - 8 is high (processes are altered to the extent that they temporarily cease); and
 - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **Probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - Assigned a score of 3 is probable (distinct possibility);
 - Assigned a score of 4 is highly probable (most likely); and
 - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **Significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
 - The status, which is described as **positive**, **negative** or **neutral**.
 - The degree to which the impact can be reversed.
 - The degree to which the impact may cause irreplaceable loss of resources.
 - The degree to which the impact can be mitigated.

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

S= (E+D+M) P; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

- **< 30 points:** (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **31-60 points:** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** (i.e. where the impact must have an influence on the decision process to develop in the area).

The specialist findings presented in this section represents a summary of the detailed and original specialist studies contained in the relevant appendices to this report (**Appendices D**) The current summary of specialist findings is provided in the interest of brevity and with a view to facilitating public participation; as contemplated in the NEMA principles. The Competent Authority, with its mandate of substantive review of the EIA report, is therefore urged to also read the original specialist studies in the relevant appendices to this report with the aim of discharging its decision-making function. ***Should any discrepancy occur between this summary, and the relevant detailed specialist study; the detailed specialist study will prevail.***

Table 12: Construction Phase Impacts

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>Vegetation and habitat</u></p> <p>Floral destruction and faunal displacement due to vegetation clearance activities.</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr> <tr> <td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr> <tr> <td>Extent</td><td>Site and Surrounds (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> <tr> <td>Significance</td><td>48 (Medium)</td><td>22 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Definite (5)	Duration	Permanent (5)	Permanent (5)	Extent	Site and Surrounds (2)	Site (1)	Magnitude	Low (4)	Minor (2)	Significance	48 (Medium)	22 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> It is recommended that areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the demarcated areas be impacted upon. All vehicles and personnel must make use of existing roads and walking paths, especially construction/operational vehicles. Areas that are denuded during construction that are not within the proposed footprint area must be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds and to support the adjacent habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. Clearing and/or disturbance activities must be conducted in a progressive linear manner, from the north to the south of the project area and over several days, so as to provide an easy escape route for all small mammals and herpetofauna. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Definite (5)																					
Duration	Permanent (5)	Permanent (5)																					
Extent	Site and Surrounds (2)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					
Significance	48 (Medium)	22 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Agricultural activities may be compromised, Loss of agricultural land and Potential of disturbance to agricultural practices as a result of Construction activities.</u></p> <p>Activities: Impacts on agriculture potential and expansion due to the placement of the substation structures in existing potential farm lands resulting in the minor loss of arable land or potential expansion of farming activities.</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr> <tr> <td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Definite (5)	Duration	Permanent (5)	Permanent (5)	<ul style="list-style-type: none"> Construction activities should be communicated and finalized with the affected property owners, and adhered to. Should this not be possible, the landowner should be informed and consulted about alternative arrangements prior to the activities commencing; The negotiation process should be largely participatory and a grievances procedure should be put in place to address any grievances should they arise; 													
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Definite (5)																					
Duration	Permanent (5)	Permanent (5)																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Extent	Site and Surrounds (2)	Site (1)	<ul style="list-style-type: none">Where necessary, mitigation measures should be implemented to avoid any interactions with domestic animals (e.g. fencing off the construction area and any dug up areas during construction). If and where necessaryEskom and/or its appointed contractor(s) should assist with the temporary relocation of livestock;Minimise vegetation clearance and disturbance to the environment and surrounding private properties	
Magnitude	Low (4)	Minor (2)		
Significance	55 (Medium)	40 (Medium)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: <u>Removal / Destruction of protected plants and plants of conservation concern.</u> The Specialist identified <i>Sclerocarya birrea</i> (Maroela trees) on site			<ul style="list-style-type: none">Should the footprint of the substation disturb any Maroela tree permits must be obtained from DAFF for removal of protected tree species if necessary.	
Description	Without Mitigation	With Mitigation		
Probability	Probable (3)	Improbable (2)		
Duration	Medium term (3)	Short term (2)		
Extent	Local (2)	Site (1)		
Magnitude	Moderate (6)	Low (1)		
Significance	55 (Medium)	40 (Medium)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: <u>Soil erosion</u> Activity: Increased soil erosion due to the removal of vegetation			<ul style="list-style-type: none">Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds.Only existing access routes and walking paths may be made use of.	Medium
Description	Without Mitigation	With Mitigation		

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																						
<table><tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr><tr><td>Duration</td><td>Long term (4)</td><td>Medium Term (3)</td></tr><tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr><tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr><tr><td>Significance</td><td>48 (Medium)</td><td>21 (Low)</td></tr><tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr></table>	Probability	Highly Probable (4)	Probable (3)	Duration	Long term (4)	Medium Term (3)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	48 (Medium)	21 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none">Undertake vegetation clearing during the dry season;Only clear vegetation where absolutely necessary;Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site and should not be located within drainage lines.Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.A stormwater management plan must be compiled and implemented.							
Probability	Highly Probable (4)	Probable (3)																								
Duration	Long term (4)	Medium Term (3)																								
Extent	Local (2)	Site (1)																								
Magnitude	Moderate (6)	Low (4)																								
Significance	48 (Medium)	21 (Low)																								
Status (positive or negative)	Negative	Negative																								
<p>Nature of the Impact: <u>Surface water contamination and degradation</u></p> <p>Activity: Oil and fuel leaks from construction vehicles</p> <table><tr><td>Description</td><td>Without Mitigation</td><td>With Mitigation</td></tr><tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr><tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr><tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr><tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr><tr><td>Significance</td><td>60 (Medium)</td><td>36 (Medium)</td></tr><tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr></table>			Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Highly Probable (4)	Duration	Long term (4)	Medium term (3)	Extent	Local (2)	Local (2)	Magnitude	Moderate (6)	Low (4)	Significance	60 (Medium)	36 (Medium)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none">All construction vehicles should be kept in good working condition;All construction vehicles should be parked in demarcated areas when not in use, and the soil in this area should be rehabilitated (if required);Drip trays should be placed under construction vehicles when not in use; to collect any spillages/leaks if necessary;No vehicles, machinery, personnel, construction material, cement, fuel, oil or waste should be allowed outside of the demarcated working areas;No fuel storage, refuelling, vehicle maintenance or vehicle depots should be allowed within 30m of the edge of any wetlands or drainage lines;		
Description	Without Mitigation	With Mitigation																								
Probability	Definite (5)	Highly Probable (4)																								
Duration	Long term (4)	Medium term (3)																								
Extent	Local (2)	Local (2)																								
Magnitude	Moderate (6)	Low (4)																								
Significance	60 (Medium)	36 (Medium)																								
Status (positive or negative)	Negative	Negative																								

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
	<ul style="list-style-type: none"> Vehicles and machinery should not be washed within 30m of the edge of any wetland or drainage line; No effluents or polluted water should be discharge into any drainage lines or wetland areas; If construction areas are to be pumped of water (e.g. after rains), this water should be pumped into an appropriate storage area, and not allowed to flow straight into any drainage lines or wetland areas. If hydrocarbon spillage occurs, clean it up immediately and dispose of at an appropriate registered landfill site. 																						
<p>Nature of the Impact: <u>Changes in water quality due to input of foreign materials.</u></p> <p>Activity: Construction and maintenance-related activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles resulting in the further reduction in watercourse function.</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr> <tr> <td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>60 (Medium)</td><td>36 (Medium)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Highly Probable (4)	Duration	Long term (4)	Medium term (3)	Extent	Local (2)	Local (2)	Magnitude	Moderate (6)	Low (4)	Significance	60 (Medium)	36 (Medium)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. Maintenance of construction vehicles / equipment should not take place within the watercourse Measures should be put in place to prevent spills or water contaminated by waste material by for example constructing sumps or drains which can contain any spills in order for contaminated water to be isolated from the watercourse and removed from the site for appropriate disposal 	<p>Although it may be controlled and largely prevented, the impact of a single spill will have a significant residual effect on the local and downstream watercourse integrity</p>
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Highly Probable (4)																					
Duration	Long term (4)	Medium term (3)																					
Extent	Local (2)	Local (2)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	60 (Medium)	36 (Medium)																					
Status (positive or negative)	Negative	Negative																					

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>Loss of wetland</u></p> <p>Activity: Soil contamination due to spillage of hazardous substances, oil and fuel leaks at the construction site from the transportation and construction vehicles as well as accidental spillages</p> <p>Construction activities within or close to the wetland</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr> <tr> <td>Duration</td><td>Permanent (3)</td><td>Long term (4)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>55 (Medium)</td><td>45 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Definite (5)	Duration	Permanent (3)	Long term (4)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	55 (Medium)	45 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> The footprint area of the construction should be kept a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas; Batching plants must be allocated outside of the 15 m buffer zones; Exposed surfaces awaiting grading must be stabilised to prevent the erosion of these surfaces. Signs of erosion must be addressed immediately to prevent further erosion; Silt traps and fences must be placed in the preferential flow paths to prevent sedimentation of the wetlands; Temporary storm water channels should be filled with aggregate and/or logs (branches included) to dissipate flows; and A suitable storm water plan must be compiled. This plan must attempt to displace and divert storm water from the Substation and discharge the water into adjacent areas without eroding the receiving areas. It is preferable that run-off velocities be reduced with energy dissipaters and flows discharged into the local watercourses. 	
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Definite (5)																					
Duration	Permanent (3)	Long term (4)																					
Extent	Local (2)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	55 (Medium)	45 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Degradation of the soil due to Spills and leaks from heavy machinery, Storage of chemicals, mixes and fuel</u></p>	<ul style="list-style-type: none"> Provide staff with hazardous materials training; Chemical toilets to be used on site, grey water should be disposed of off-site at a licensed waste treatment works; 	Medium																					

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Activity: Soil contamination due to spillage of hazardous substances, oil and fuel leaks at the construction site from the transportation and construction vehicles as well as accidental spillages</p> <table border="1" data-bbox="203 438 826 726"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>33 (Medium)</td><td>14 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Medium term (3)	Short term (2)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	33 (Medium)	14 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> Concrete mixing should be undertaken in a mixing trays/pan. No mixing of cement/concrete should take place within 30m of aquatic features or in natural vegetation; No servicing or repair of vehicles on site (unless absolutely necessary); No concrete mixing on site unless on a mortar board; Portable toilets must be provided in the ratio provided in the Health and Safety Act. Portable toilets must be regularly pumped dry to ensure that the system does not degrade over time and spill into the surrounding area. Construction Phase Environmental Officer & Health and Safety Officer Number of toilets per staff member. Waste levels Daily The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. 	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Medium term (3)	Short term (2)																					
Extent	Local (2)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	33 (Medium)	14 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: Increased risk of damage due to unmanaged fires</p> <p>Activity: Increased occurrence of fires due to unmanaged fires and its increased severity due to human interference</p> <table border="1" data-bbox="203 1174 826 1396"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Very Short duration (1)</td><td>Very short duration (1)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Very Short duration (1)	Very short duration (1)	Extent	Local (2)	Site (1)	Magnitude	Low (4)	Minor (2)	<ul style="list-style-type: none"> The safety officer should control on-site fires; Firefighting equipment to be kept on site and serviced regularly; No fires to be lit on site and smoking to occur in designated areas only 	low						
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Very Short duration (1)	Very short duration (1)																					
Extent	Local (2)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Significance	21 (Low)	8 (Low)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: <u>Water resource pollution and Contamination</u> Activity: improper storm water management			<ul style="list-style-type: none"> A proper storm water drainage system must be able to divert runoff from maximum expected flood events. Storm water must be diverted away from areas of possible pollution. Internal storm water reticulation is to be constructed early on in the development period in order to significantly reduce storm water during construction. 	
Description	Without Mitigation	With Mitigation		
Probability	Definite (5)	Highly Probable (4)		
Duration	Medium term (3)	Medium term (3)		
Extent	Local (2)	Local (2)		
Magnitude	Moderate (6)	Low (4)		
Significance	55 (Medium)	36 (Medium)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: <u>Potential increase in alien and invasive vegetation.</u> The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation around the development are unsuccessful or is not enforced, exotic and invasive vegetation may further invade the area.			<ul style="list-style-type: none"> An alien management plan must be implemented as directed by the ECO. The plan should limit vegetation clearing to the servitude of the powerline and no more. This plan must be developed prior to construction. All waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas. Herbicides must be used for control of invasive plants throughout the lifecycle of a project 	Medium
Description	Without Mitigation	With Mitigation		

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED						
Probability	Highly Probable (4)	Probable (3)		<ul style="list-style-type: none">It must be made an offence for any staff to take/bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic is allowed to be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.							
Duration	Short Duration (2)	Very Short term (2)									
Extent	Local (2)	Site (1)									
Magnitude	Moderate (6)	Low (4)									
Significance	40 (Medium)	21 (Low)									
Status (positive or negative)	Negative	Negative									
Nature of the Impact: <u>Increased Dust Generation-Increased dust generation due to the clearing of vegetation, construction activities and earthworks</u> Activity: Construction machinery and heavy vehicles which are likely to make use of the existing gravel roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by affected properties. Trucks may potentially distribute dust along internal access roads as well as into the watercourse given the nature of the activities. Source of Impact: <ul style="list-style-type: none">Clearing of vegetation.Construction vehicles. <table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr></table>				Description	Without Mitigation	With Mitigation	Probability	Highly Probable (4)	Probable (3)	<ul style="list-style-type: none">Dust-reducing mitigation measures must be put in place and must be strictly adhered to, particularly for all dirt roads and any earth dumps. This includes the wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. Only environmentally friendly suppressants may be used to avoid the pollution of water sources. Speed limits must be put in place to reduce erosion, and speed bumps should also be constructed.The clearing of vegetation must be kept to the minimal;Avoid unnecessary movement of construction vehicles on site and outside demarcated areas.A continuous dust monitoring process needs to be undertaken during construction.	Medium
Description	Without Mitigation	With Mitigation									
Probability	Highly Probable (4)	Probable (3)									

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Duration	Very short term (1)	Very Short term (1)		<ul style="list-style-type: none"> All vehicles transporting friable materials such as sand, rubble etc must be covered by a tarpaulin or wet down. 	
Extent	Local (2)	Site (1)			
Magnitude	Moderate (6)	Low (4)			
Significance	36 (Medium)	18 (Low)			
Status (positive or negative)	Negative	Negative			
<p>Nature of the Impact: Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste.</p> <p>All contaminating substances, including waste, must be handled properly on site to prevent contamination of surrounding habitats through contaminated runoff.</p>				<ul style="list-style-type: none"> Plan and implement a proper stormwater management plan from the onset. Facilities will be provided for storage of all hazardous substances and waste to prevent the exposure of these substances to the environment. These will be erected on site before any substances are brought to site. The aim is to PREVENT exposure of fauna to any potential toxin. All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks. All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. Refuse bins with properly secured lids will be placed on site to collect waste for separation, recycling and disposal. All hydrocarbons and cement spills on bare ground will be cleared immediately. <ul style="list-style-type: none"> Inspect and clear all litter and waste from the site and surrounds. 	Medium
Description	Without Mitigation	With Mitigation			
Probability	Highly Probable (4)	Probable (3)			
Duration	Short term (2)	Very Short term (1)			
Extent	Local (2)	Site (1)			
Magnitude	High (6)	Low (4)			
Significance	40 (Medium)	18 (Low)			
Status (positive or negative)	Negative	Negative			

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>The construction activities will cause an increase in the ambient noise levels</u></p> <p>Activities: increased noise levels-Increased noise generation due to construction activities and the movement of construction vehicles</p> <table border="1" data-bbox="203 531 824 957"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>short term (2)</td><td>Very short term (1)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>33 (Medium)</td><td>12 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	short term (2)	Very short term (1)	Extent	Site (1)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	33 (Medium)	12 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> Noise must be kept to a minimum during the evenings/ at night to minimize all possible disturbances to amphibian species and nocturnal mammals. Signs must be put up in order to show the importance and sensitivity of surrounding areas and their functions. All noise and sounds generated during the proposed activity must comply with the relevant SANS codes and standards; All construction equipment or machinery should be switched off when not in use; Construction equipment must be kept in good working condition; Plant and vehicles must be in good working order and inspected daily. Use silencers on all equipment, where appropriate. Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above. No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	short term (2)	Very short term (1)																					
Extent	Site (1)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	33 (Medium)	12 (Low)																					
Status (positive or negative)	Negative	Negative																					

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>Increase in traffic congestion due to the construction vehicles</u></p> <p>Activities: Increase in traffic volumes and associated congestion due to the transportation and construction vehicles travelling to and from the construction site.</p> <p>Traffic congestion in and around the area may offend locals and road users during the construction phase.</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>33 (Medium)</td><td>14 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Short term (2)	Short term (2)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	33 (Medium)	14 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> The proposed Substation is preferred as it is within and surrounded by open land Furthermore, the proposed site has adequate access Construction vehicles are not to be parked on the roads thereby blocking the way to the properties. Clear signs should be displayed and entrance to the site indicating a construction site and turning construction vehicles. Construction vehicles are to avoid main roads during peak traffic hours and mitigation measures outlined in the EMP are to be implemented. Ensure an appropriate access procedure to avoid backlog of traffic at the entry point to the site. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Short term (2)	Short term (2)																					
Extent	Local (2)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	33 (Medium)	14 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Loss and disturbance of heritage sites due to the development.</u></p> <p>Activity: Destruction of heritage sites (grave sites and ruins) identified along various sections of the proposed new substation</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	<ul style="list-style-type: none"> Manage footprint of development to avoid the identified heritage resources. If any palaeontological materials (such as dense bone accumulations) are uncovered during the course of development then work in the immediate area should be halted. The find should need to be reported to the heritage authorities and may require inspection by an appropriate specialist. 	Low															
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Duration	Permanent (5)	Permanent (5)			
Extent	Site (1)	Site (1)			
Magnitude	Moderate (6)	Minor (2)			
Significance	36 (Medium)	16 (Low)			
Status (positive or negative)	Negative	Negative			
Nature of the Impact: <u>Loss and disturbance to palaeontology due to the development.</u>				<ul style="list-style-type: none"> If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures; especially shallow caves. A Phase 2 Palaeontological Mitigation is only required if fossils are found during construction. Protocol for finds must be followed. It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons. 	Medium
Description	Without Mitigation	With Mitigation			
Probability	Very improbable (1)	Very improbable (1)			
Duration	Permanent (5)	Permanent (5)			
Extent	Site (1)	Site (1)			
Magnitude	Minor (2)	Minor (2)			
Significance	8 (Low)	8 (Low)			
Status (positive or negative)	Negative	Negative			
Nature of Impact: <u>Visual</u>				<ul style="list-style-type: none"> The proposed substation site is preferred as it is within and surrounded by open land; 	High

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Surface disturbances and the presence of a construction team are uncharacteristic events in the study area and may cause unsightly views as a result of the activity to the property owners as well as neighbouring property owners.</p> <p>Introduction of construction equipment, ground staff, construction vehicles and equipment that is unfamiliar in the baseline environment.</p> <p>Source of Impact:</p> <ul style="list-style-type: none"> • Construction vehicles. • Construction material. • Barricading and fencing. • Rubble on site. • Construction crew. <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr> <tr> <td>Significance</td><td>55 (Medium)</td><td>36 (Medium)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Highly Probable (4)	Duration	Short term (2)	Short term (2)	Extent	Site (1)	Site (1)	Magnitude	High (8)	Moderate (6)	Significance	55 (Medium)	36 (Medium)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> • Construction vehicles should only park in designated areas. • Waste to be kept only at specific sites on site and to be removed weekly. • Construction camp or laydown yards must be completely screened from sensitive viewpoints. Preferably, construction camps should be in a dedicated construction camp in an area that is already disturbed. • Avoid the construction of additional access roads by keeping to existing roads where possible. • Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area. • Clearly demarcate the construction site to limit the area of disturbance. • Keep dust levels down by regularly wetting dirt roads and exposed soil areas. • Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site. • Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints. 	
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Highly Probable (4)																					
Duration	Short term (2)	Short term (2)																					
Extent	Site (1)	Site (1)																					
Magnitude	High (8)	Moderate (6)																					
Significance	55 (Medium)	36 (Medium)																					
Status (positive or negative)	Negative	Negative																					

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of Impact: <u>Crime, safety and security</u></p> <p>Source of Impact:</p> <ul style="list-style-type: none"> Lack of security. Easy access. Construction area not enclosed. Poorly trained personnel using equipment and vehicles. <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>27 (Low)</td><td>14 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Short term (2)	Short term (2)	Extent	Site (1)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	27 (Low)	14 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> Ensure that the construction vehicles as well as equipment are under the control of competent personnel and are in proper working order. Ensure that the contact details of the police or security company and ambulance services are available on site. Limit access to the construction camp to construction workers through access control. Ensure that the handling of equipment and materials is supervised and adequately instructed. Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr. The security fence around the development site must be completed before construction commences internally. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Short term (2)	Short term (2)																					
Extent	Site (1)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	27 (Low)	14 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of impact: <u>Pollution due to inappropriate handling of generated waste on site.</u></p> <p>Waste generation could have negative impacts on the environment if not controlled adequately. Waste streams likely to include domestic waste, spent grinding material, mixed concrete, paint cans and brushes, construction rubble and other construction waste.</p>	<ul style="list-style-type: none"> General waste should be placed in a water tight container and disposed of on a regular basis. Where possible construction waste should be recycled or reused. Waste should be temporarily stored on site before being disposed of appropriately. Records of all waste taken off site and disposed of must be kept as evidence. 	Medium																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Description	Without Mitigation	With Mitigation	<ul style="list-style-type: none"> Building rubble must be re-used, where possible, where this is not possible, the rubble will be disposed of at an appropriate site. Burning of waste material will not be permitted. Any hazardous waste that may be generated should be separated from general waste and stored in clearly marked and properly sealed secondary containers. All waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. Any litter, spills, fuels, chemical and human waste in and around the project area must be removed and disposed of timeously and responsibly. It must be made an offence to litter or dump any material outside of specially demarcated and managed zones. Signs and protocols must be established to explain and enforce this. Where a registered disposal facility is not available close to the project area, the Contractor/property owner shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site. Waste may never be stored in an open pit where it is susceptible to the elements such as wind and rain. 	
Probability	Highly Probable (4)	Probable (3)		
Duration	Short term (2)	Very Short term (1)		
Extent	Local (2)	Site (1)		
Magnitude	High (8)	Low (4)		
Significance	48 (Medium)	18 (Low)		
Status (positive or negative)	Negative	Negative		
Nature of impact: <u>Socio-economic</u> Source of Impact: <ul style="list-style-type: none"> Job creation for local skilled labour, general labour and suppliers. 			<ul style="list-style-type: none"> General and skilled locals must be considered for employment during construction (contractor and construction crew). Local suppliers must be considered for the purchase of construction material. 	Low (Positive)

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<ul style="list-style-type: none"> Skills development. 				
Description	Without Enhancement	With Enhancement		
Probability	Highly Probable (4)	Definite (5)		
Duration	Short term (2)	Short term (2)		
Extent	Local (2)	Local (2)		
Magnitude	Minor (2)	Moderate (6)		
Significance	24(Low)	50 (Medium)		
Status (positive or negative)	Positive	Positive		

Table 13: Operational Phase Impacts

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>Maintenance activities resulting in the loss of flora and fauna</u></p> <p>Floral destruction and faunal displacement due to clearing or trimming of natural vegetation located within the servitude of the powerline as part of routine maintenance operations</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr> <tr> <td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> <tr> <td>Significance</td><td>50 (Medium)</td><td>40 (Medium)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Definite (5)	Duration	Permanent (5)	Permanent (5)	Extent	Site (1)	Site (1)	Magnitude	Low (4)	Minor (2)	Significance	50 (Medium)	40 (Medium)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. • Maintenance impacts must be contained within the footprint of • the substation structures and / or the servitude routes of the powerline; • Ensure that unnecessary impacts on natural vegetation do not occur; • Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away; • Maintenance activities should be restricted to daylight hours when the majority of faunal species are inactive; and • No animals may be snared, captured or killed. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Definite (5)																					
Duration	Permanent (5)	Permanent (5)																					
Extent	Site (1)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					
Significance	50 (Medium)	40 (Medium)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Agricultural activities may be compromised, Loss of agricultural land and Potential of disturbance to agricultural practices as a result of Construction activities.</u></p> <p>Activities: Impacts on agriculture potential and expansion due to the placement of the substation structures in existing potential farm lands resulting in the minor loss of arable land or potential expansion of farming activities.</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr> <tr> <td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Definite (5)	Definite (5)	Duration	Permanent (5)	Permanent (5)	Extent	Site (1)	Site (1)	Magnitude	Low (4)	Minor (2)	<ul style="list-style-type: none"> • Construction activities should be communicated and finalized with the affected property owners, and adhered to. Should this not be possible, the landowner should be informed and consulted about alternative arrangements prior to the activities commencing; • The negotiation process should be largely participatory and a grievances procedure should be put in place to address any grievances should they arise; • Where necessary, mitigation measures should be implemented to avoid any interactions with domestic animals (e.g. fencing off the 							
Description	Without Mitigation	With Mitigation																					
Probability	Definite (5)	Definite (5)																					
Duration	Permanent (5)	Permanent (5)																					
Extent	Site (1)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Significance	50 (Medium)	40 (Medium)	construction area and any dug up areas during construction). If and where necessary <ul style="list-style-type: none">Eskom and/or its appointed contractor(s) should assist with the temporary relocation of livestock;Minimise vegetation clearance and disturbance to the environment and surrounding private properties	
Status (positive or negative)	Negative	Negative		
Nature of the Impact: Removal / Destruction of protected plants and plants of conservation concern. The Specialist identified <i>Sclerocarya birrea</i> (Maroela trees) on site			<ul style="list-style-type: none">Prevent trampling and edge effects beyond the approved development footprint.The relocated species should be monitored for at least three years post relocation. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible.	
Description	Without Mitigation	With Mitigation		
Probability	Highly Probable (4)	Probable (3)		
Duration	Permanent (5)	Permanent (5)		
Extent	Site (1)	Site (1)		
Magnitude	Low (4)	Minor (2)		
Significance	40 (Medium)	24 (Low)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: Soil erosion due to maintenance activities			<ul style="list-style-type: none">Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood eventsApply the appropriate erosion protection measures where erosion is identified;Regular maintenance of the identified access roads as and when required;	Medium
Activity: Increased soil erosion due to the deterioration of access roads to the powerline servitude for operation and routine maintenance activities				
Description	Without Mitigation	With Mitigation		

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Probability	Highly Probable (4)	Probable (3)	<ul style="list-style-type: none"> Improve the access of the identified access roads to ensure suitable passage for equipment, erosion control and maintenance of proper drainage. 	
Duration	Permanent (5)	Long term (4)		
Extent	Site (1)	Site (1)		
Magnitude	Low (4)	Minor (2)		
Significance	40 (Medium)	21 (Low)		
Status (positive or negative)	Negative	Negative		
Nature of the Impact: Surface water contamination and degradation Activity: Oil and fuel leaks from maintenance vehicles			<ul style="list-style-type: none"> All construction vehicles should be kept in good working condition; All construction vehicles should be parked in demarcated areas when not in use, and the soil in this area should be rehabilitated (if required); Drip trays should be placed under construction vehicles when not in use; to collect any spillages/leaks if necessary; No vehicles, machinery, personnel, construction material, cement, fuel, oil or waste should be allowed outside of the demarcated working areas; No fuel storage, refuelling, vehicle maintenance or vehicle depots should be allowed within 30m of the edge of any wetlands or drainage lines; Vehicles and machinery should not be washed within 30m of the edge of any wetland or drainage line; No effluents or polluted water should be discharge into any drainage lines or wetland areas; 	
Description	Without Mitigation	With Mitigation		
Probability	Highly Probable (4)	probable (3)		
Duration	Long term (4)	Short term (3)		
Extent	Local (2)	Site (1)		
Magnitude	Low (4)	Minor (2)		
Significance	40 (Medium)	18(Low)		
Status (positive or negative)	Negative	Negative		

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
	<ul style="list-style-type: none"> • If construction areas are to be pumped of water (e.g. after rains), this water should be pumped into an appropriate storage area, and not allowed to flow straight into any drainage lines or wetland areas. • If hydrocarbon spillage occurs, clean it up immediately and dispose of at an appropriate registered landfill site. 																						
<p>Nature of the Impact: <u>Degradation of the soil due to hazardous substance spillages</u></p> <p>Activity: Soil contamination due to spillage of hazardous substances, oil and fuel leaks at the substation site from the transportation and maintenance vehicles as well as accidental spillages</p> <table border="1" data-bbox="203 735 826 1023"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> <tr> <td>Significance</td><td>24 (Low)</td><td>10 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Medium term (3)	Short term (2)	Extent	Site (1)	Site (1)	Magnitude	Low (4)	Minor (2)	Significance	24 (Low)	10 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> • Continuous monitoring must be undertaken. • Maintenance must be done regularly. • Spills must be reported and contained immediately. • Rehabilitation must be undertaken where required. • Spill trays and drip trays must always be available on site. • Bunding must be in place as well. • The Contractor must supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Medium term (3)	Short term (2)																					
Extent	Site (1)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					
Significance	24 (Low)	10 (Low)																					
Status (positive or negative)	Negative	Negative																					

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of the Impact: <u>Increased risk of damage due to unmanaged fires</u></p> <p>Activity: Increased occurrence of fires due to unmanaged fires and its increased severity due to human interference</p> <table> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Very short term (1)</td><td>Very Short term (1)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>27 (Low)</td><td>12 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Very short term (1)	Very Short term (1)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	27 (Low)	12 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> The safety officer should control on-site fires; Firefighting equipment to be kept on site and serviced regularly; No fires to be lit on site and smoking to occur in designated areas only 	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Very short term (1)	Very Short term (1)																					
Extent	Local (2)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	27 (Low)	12 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Water resource pollution and Contamination</u></p> <p>Activity: Storm water management</p> <table> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> <tr> <td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr> <tr> <td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>33 (Medium)</td><td>14 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Medium term (3)	Short term (2)	Extent	Local (2)	Site (1)	Magnitude	Moderate (6)	Low (4)	Significance	33 (Medium)	14 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> A proper storm water drainage system must be able to divert runoff from maximum expected flood events. Storm water must be diverted away from areas of possible pollution. Internal storm water reticulation is to be constructed early on in the development period in order to significantly reduce storm water during construction. 	
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Improbable (2)																					
Duration	Medium term (3)	Short term (2)																					
Extent	Local (2)	Site (1)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	33 (Medium)	14 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of the Impact: <u>Potential increase in alien and invasive vegetation.</u></p> <p>Increased risk of alien invasion for vegetation species due to the disturbance in the landscape during operational and maintenance activities</p>	<ul style="list-style-type: none"> Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible; 	Medium																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr><tr><td>Duration</td><td>Long term (4)</td><td>Short term (2)</td></tr><tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr><tr><td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr><tr><td>Significance</td><td>30 (Low)</td><td>10 (Low)</td></tr><tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr></table>			Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Improbable (2)	Duration	Long term (4)	Short term (2)	Extent	Local (2)	Site (1)	Magnitude	Low (4)	Minor (2)	Significance	30 (Low)	10 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none">• Soil stockpiles should not be trans-located from areas with alien plants into the site;• Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stock-piled soil;• Any alien plants must be immediately controlled to avoid establishment of a soil seed bank; and• Create an integrated alien invasive management programme to be implemented during maintenance activities.	
Description	Without Mitigation	With Mitigation																							
Probability	Probable (3)	Improbable (2)																							
Duration	Long term (4)	Short term (2)																							
Extent	Local (2)	Site (1)																							
Magnitude	Low (4)	Minor (2)																							
Significance	30 (Low)	10 (Low)																							
Status (positive or negative)	Negative	Negative																							
<p>Nature of the Impact: <u>Increased dust generation due to maintenance activities</u></p> <p>Activity: Construction machinery and heavy vehicles during maintenance which will likely make use of the existing gravel roads to transport equipment and material to the site are likely to generate dust which is likely to be perceptible by adjacent residents and the watercourse. Trucks may potentially distribute dust along internal access roads as well as into the watercourse given the nature of maintenance activities.</p> <p>Source of Impact:</p> <ul style="list-style-type: none">• Maintenance vehicles.• Machinery used for maintenance. <table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr></table>			Description	Without Mitigation	With Mitigation	<ul style="list-style-type: none">• Dust suppression and wet spraying should be implemented during operation and maintenance works.• Limit maintenance hours to daytime and weekdays.• Speed limits should be enforced to ensure that the generation of dust by construction vehicles during maintenance and for operational aspects are limited	Medium																		
Description	Without Mitigation	With Mitigation																							

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Probability	Possible (2)	Possible (2)			
Duration	Temporary (1)	Temporary (1)			
Extent	Local (2)	Site (1)			
Magnitude	Low (4)	minor (2)			
Significance	12 (Low)	8 (Low)			
Status (positive or negative)	Negative	Negative			
Nature of the Impact: <u>Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste.</u> All contaminating substances, including waste, must be handled properly on site to prevent contamination of surrounding habitats through contaminated runoff.				<ul style="list-style-type: none">During Operation and Maintenance Activities:Discontinue use of all faulty machinery / equipment on site until properly repaired.Ensure proper stormwater management throughout.Facilities will be provided for storage of all hazardous substances and waste to prevent the exposure of these substances to the environment. These will be erected on site before any substances are brought to site. The aim is to PREVENT exposure of fauna to any potential toxin.All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks.<ul style="list-style-type: none">All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. Refuse bins with	Medium
Description	Without Mitigation	With Mitigation			
Probability	Probable (3)	Improbable (2)			
Duration	Long term (4)	Short term (3)			
Extent	Local (2)	Site (1)			
Magnitude	Low (4)	Low (4)			
Significance	30 (Low)	16 (Low)			
Status (positive or negative)	Negative	Negative			

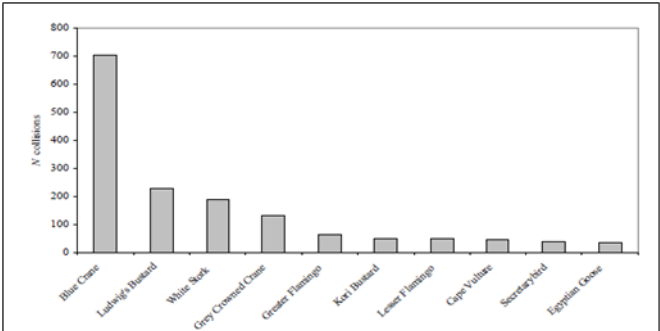
POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
	<p>properly secured lids will be placed on site to collect waste for separation, recycling and disposal.</p> <ul style="list-style-type: none"> • Cement bags will be stored under a tarpaulin and on an impervious sheet. Cement mixing will take place within a designated flat area only. • All hydrocarbons and cement spills on bare ground will be cleared immediately. • Inspect and clear all litter and waste from the site and surrounds. 																						
<p>Nature of the Impact: <u>The maintenance activities will cause an increase in the ambient noise levels</u></p> <p>Activities: Construction vehicles during maintenance. Equipment and machinery during maintenance</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Possible (2)</td><td>Possible (2)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Temporary (1)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>16 (Low)</td><td>12 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Possible (2)	Possible (2)	Duration	Short term (2)	Temporary (1)	Extent	Local (2)	Site (1)	Magnitude	Low (4)	Low (4)	Significance	16 (Low)	12 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> • Inform residents of planned maintenance works. • Institute noise control measures throughout maintenance periods. • Maintenance activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment. • Speed limits must be adhered to 100KM on tar and 60KM on gravel roads. 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Possible (2)	Possible (2)																					
Duration	Short term (2)	Temporary (1)																					
Extent	Local (2)	Site (1)																					
Magnitude	Low (4)	Low (4)																					
Significance	16 (Low)	12 (Low)																					
Status (positive or negative)	Negative	Negative																					
Nature of the Impact- <u>Electricity Supply</u>	<ul style="list-style-type: none"> • Regular maintenance 	Medium																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<table><tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr><tr><td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr><tr><td>Duration</td><td>Long term (4)</td><td>Permanent (5)</td></tr><tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr><tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr><tr><td>Significance</td><td>60 (Medium)</td><td>75 (High)</td></tr><tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr></table>			Description	Without Enhancement	With Enhancement	Probability	Definite (5)	Definite (5)	Duration	Long term (4)	Permanent (5)	Extent	Local (2)	Local (2)	Magnitude	Moderate (6)	High (8)	Significance	60 (Medium)	75 (High)	Status (positive or negative)	Positive	Positive		
Description	Without Enhancement	With Enhancement																							
Probability	Definite (5)	Definite (5)																							
Duration	Long term (4)	Permanent (5)																							
Extent	Local (2)	Local (2)																							
Magnitude	Moderate (6)	High (8)																							
Significance	60 (Medium)	75 (High)																							
Status (positive or negative)	Positive	Positive																							
<p>Nature of the Impact: <u>Loss and disturbance of heritage sites due to the development.</u></p> <p>Activity: Destruction of heritage sites (grave sites and ruins) identified along various sections of the proposed new substation</p> <table><tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr><tr><td>Probability</td><td>Very improbable (1)</td><td>Very improbable (1)</td></tr><tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr><tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr><tr><td>Magnitude</td><td>Minor (2)</td><td>Minor (2)</td></tr><tr><td>Significance</td><td>8 (Low)</td><td>8 (Low)</td></tr></table>			Description	Without Mitigation	With Mitigation	Probability	Very improbable (1)	Very improbable (1)	Duration	Permanent (5)	Permanent (5)	Extent	Site (1)	Site (1)	Magnitude	Minor (2)	Minor (2)	Significance	8 (Low)	8 (Low)	Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.	Low			
Description	Without Mitigation	With Mitigation																							
Probability	Very improbable (1)	Very improbable (1)																							
Duration	Permanent (5)	Permanent (5)																							
Extent	Site (1)	Site (1)																							
Magnitude	Minor (2)	Minor (2)																							
Significance	8 (Low)	8 (Low)																							

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<i>Status (positive or negative)</i>	Negative	Negative			
Nature of the Impact: <u>Loss and disturbance to palaeontology due to the development.</u>				<ul style="list-style-type: none"> If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures; especially shallow caves. Protocol for finds must be followed. It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons. 	Medium
Description	Without Mitigation	With Mitigation			
Probability	Very improbable (1)	Very improbable (1)			
Duration	Permanent (5)	Permanent (5)			
Extent	Site (1)	Site (1)			
Magnitude	Minor (2)	Minor (2)			
Significance	8 (Low)	8 (Low)			
<i>Status (positive or negative)</i>	Negative	Negative			
Nature of Impact: <u>Visual</u>				<ul style="list-style-type: none"> Regular maintenance 	High
Description	Without Enhancement	With Enhancement			
Probability	Definite (5)	Definite (5)			
Duration	Long term (4)	Long term (4)			
Extent	Local (2)	Local (2)			
Magnitude	Moderate (6)	Low (4)			
Significance	60 (Medium)	50 (Medium)			
<i>Status (positive or negative)</i>	Negative	Negative			

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>Nature of Impact: <u>Increase in theft of electrical cables</u></p> <p>Source of Impact:</p> <ul style="list-style-type: none"> Lack of security. Easy access. <p>Increased theft and vandalism of the distribution line and associated infrastructure resulting in the occurrence of potential deaths, interruption in electricity supply and the increased maintenance intervals</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>24 (low)</td><td>14 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Short term (2)	Short term (2)	Extent	Local (2)	Site (1)	Magnitude	Low (4)	Low (4)	Significance	24 (low)	14 (Low)	Status (positive or negative)	Negative	Negative	<ul style="list-style-type: none"> Access control at the substation needs to be implemented 	Medium
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Short term (2)	Short term (2)																					
Extent	Local (2)	Site (1)																					
Magnitude	Low (4)	Low (4)																					
Significance	24 (low)	14 (Low)																					
Status (positive or negative)	Negative	Negative																					
<p>Nature of impact: <u>Pollution due to inappropriate handling of generated waste on site.</u></p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr> <tr> <td>Duration</td><td>Short term (2)</td><td>Very Short term (1)</td></tr> <tr> <td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr> <tr> <td>Magnitude</td><td>Low (4)</td><td>Minor (2)</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Probable (3)	Possible (2)	Duration	Short term (2)	Very Short term (1)	Extent	Site (1)	Site (1)	Magnitude	Low (4)	Minor (2)	<ul style="list-style-type: none"> General waste should be placed in a water tight container and disposed of on a regular basis. 	Medium						
Description	Without Mitigation	With Mitigation																					
Probability	Probable (3)	Possible (2)																					
Duration	Short term (2)	Very Short term (1)																					
Extent	Site (1)	Site (1)																					
Magnitude	Low (4)	Minor (2)																					

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Significance	21 (Low)	8 (Low)			
Status (positive or negative)	Negative	Negative			
<p>Nature of the Impact: <u>Mortality of SCC and non-SCC priority species due to collision with the 20 m 132 LILO powerline conductors/earthwires.</u></p> <p>Collisions are the biggest single threat posed by power lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds. These species are mostly heavy-bodied birds with limited maneuverability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines. Unfortunately, many of the collision sensitive species are considered threatened in southern Africa. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because a number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth. However, from incidental record keeping by the Endangered Wildlife Trust: Wildlife & Energy Programme it is possible to give a measure of what species are likely to be impacted upon (see the figure below). This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for any specific line. Relevant to this LILO power line development, collisions may occur, but are likely to be infrequent given the short length of power line , the location of the loop-in and loop-out power lines directly adjacent to each other and the power lines proximity to the existing power high voltage power lines within the PAOI thereby reducing the risk of collisions to birds. The reasons for that are two-fold, namely it creates a more visible obstacle to</p>				<ul style="list-style-type: none"> Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the Nkambeni Substation and 132kV LILO power lines to the Eskom-Endangered Wildlife Trust Strategic Partnership. Insulating material (if applied) to be maintained during the operational life span of the Nkambeni Substation and 132kV LILO powerlines 	Low

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>birds and the resident birds, particularly breeding adults, which are accustomed to an obstacle in that geographic location and have learnt to avoid it.</p>  <p>Figure: The top ten collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/EWT Strategic Partnership central incident register 1996 – 2007</p> <table border="1"> <thead> <tr> <th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr> </thead> <tbody> <tr> <td>Probability</td><td>Possible (2)</td><td>Highly Unlikely (1)</td></tr> <tr> <td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr> <tr> <td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr> <tr> <td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr> <tr> <td>Significance</td><td>24 (Low)</td><td>9 (Low)</td></tr> <tr> <td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	Probability	Possible (2)	Highly Unlikely (1)	Duration	Long term (4)	Medium term (3)	Extent	Local (2)	Local (2)	Magnitude	Moderate (6)	Low (4)	Significance	24 (Low)	9 (Low)	Status (positive or negative)	Negative	Negative		
Description	Without Mitigation	With Mitigation																					
Probability	Possible (2)	Highly Unlikely (1)																					
Duration	Long term (4)	Medium term (3)																					
Extent	Local (2)	Local (2)																					
Magnitude	Moderate (6)	Low (4)																					
Significance	24 (Low)	9 (Low)																					
Status (positive or negative)	Negative	Negative																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<p>Nature of the Impact: Mortality of SCC and non-SCC priority species as a result of electrocution on the 132 kV LILO infrastructure.</p> <p>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. Electrocution risk is strongly influenced by the power line voltage and design of the tower/pole structure and mainly affects larger, perching species that are capable of spanning the spaces between energized components. This is particularly likely when more than one bird attempts to sit on the same pole, a behaviour that is typical of gregarious vulture species when perching or roosting. If the proposed 132 kV LILO power lines are constructed using a 132kV steel monopole specification, the clearance distances between the live components and/or live and earthed components of the 132/22kV substation structure should be sufficient to reduce the risk of electrocutions for most raptor species. However, this is not the case for the vulture species recorded in the PAOI. The best possible mitigation is the construction of the power line using an Eskom approved bird friendly pole/tower design (DT 7641/7649) accordance with the Distribution Technical Bulletin relating to bird friendly structures. Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.</p>			<ul style="list-style-type: none"> The 132 kV LILO must be constructed using a bird friendly structure. Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms. 	Low
Description	Without Mitigation	With Mitigation		

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Probability	Highly Probable (4)	Highly Unlikely (1)			
Duration	Long term (4)	Short term (2)			
Extent	Regional (3)	Local (2)			
Magnitude	Moderate (6)	Minor (2)			
Significance	52 (Medium)	6 (Low)			
Status (positive or negative)	Negative	Negative			
Nature of the Impact: Mortality of SCC and non-SCC priority species as a result of electrocution within the Nkambeni Substation. Electrocutions within the proposed Nkambeni Substation are possible but should not affect the more sensitive SCC as these species are unlikely to use the infrastructure within the substation yards for perching or roosting. Since it is difficult to predict with any certainty where birds are likely to nest within the substation yards, coupled with the costs associated with insulating the entire substation, electrocutions will need to be mitigated using site-specific recommendations if and when they occur.				<ul style="list-style-type: none">Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the Nkambeni Substation and 132kV LILO power lines to the Eskom-Endangered Wildlife Trust Strategic Partnership.Insulating material (if applied) to be maintained during the operational life span of the Nkambeni Substation and 132kV LILO powerlines.	Low
Description	Without Mitigation	With Mitigation			
Probability	Possible (2)	Highly Unlikely (1)			
Duration	Long term (4)	Short term (2)			
Extent	Local (2)	Local (2)			
Magnitude	Low (4)	Minor (2)			
Significance	20 (Low)	6 (Low)			

POTENTIAL IMPACTS				PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Status (positive or negative)	Negative	Negative			
Nature of impact: <u>Socioeconomic</u> Source of Impact: <ul style="list-style-type: none"> Overall upliftment of the area. 				<ul style="list-style-type: none"> Regular maintenance 	Medium (Positive)
Description	Without Enhancement	With Enhancement			
Probability	Definite (5)	Definite (5)			
Duration	Long term (4)	Permanent (5)			
Extent	Local (2)	Local (2)			
Magnitude	Moderate (6)	High (8)			
Significance	60 (Medium)	75 (High)			
Status (positive or negative)	Positive	Positive			

8.2 No-Go Alternative

No go Alternative (compulsory). This is the alternative of not developing the substation. This alternative will result in limited construction impacts already occurring in the study area. However, should the infrastructure not be developed as proposed, areas within and surrounding Nkambeni and Mahushu will remain without electricity and the existing grid will remain under pressure. This is an undesirable alternative for the project as it will pose negative impacts from the social and economic perspective and is not considered desirable. The negative impacts of the no go alternative are considered to outweigh the positive impacts of this alternative. The no go alternative is therefore not preferred.

Table 14: Summary of the no-go alternatives

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Impact to Vegetation and habitat – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Impact on Agricultural activities – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Removal / Destruction of protected plants and plants of conservation concern – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Potential increase in soil erosion– No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Surface water contamination and degradation – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Changes in water quality due to input of foreign materials– No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Loss of wetland – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk

Potential increase in alien and invasive vegetation – No-go would mean study site status quo is maintained. - No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Degradation of the soil due to Spills and leaks from heavy machinery, Storage of chemicals, mixes and fuel No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Increased risk of damage due to unmanaged fires– No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Water resource pollution and Contamination– No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Displacement of SCC and non-SCC priority species as a result of habitat loss & transformation – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Displacement of SCC and non-SCC priority species as a result of disturbance – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Loss and disturbance of heritage sites due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk

Loss and disturbance to palaeontology due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Visual – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Dust generation – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Crime, safety and security: during construction – No-go would imply that the area remains as is.	P – High	There are no mitigation measures	P – High	Low risk
Noise – No-go would imply no construction noise.	P – High	There are no mitigation measures	P – High	Low risk
Traffic and accessibility – No-go would imply no impact to traffic and accessibility.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Pollution due to inappropriate handling of generated waste on site – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Hazardous substance spillages anticipated during the operational period – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Socioeconomic impacts anticipated during the construction period – No-go would mean no local job opportunities for general and skilled labourers as well as no opportunities for local retailers.	N – High	The development of the substation will provide job opportunities for locals and for local retailers.	N – High	High risk
Socioeconomic impacts anticipated during the operational period – No-go would mean that overall community upliftment will not occur.	N – High	By providing electricity to the local communities in the area, overall upliftment in these areas will occur as a	N – High	High risk

		basic need is being met.		
Electricity supply anticipated during the operational period – No-go would mean that electricity will not be supplied to the local communities in the area.	N – High	The substation will connect to the existing grid and will be able to take the pressure off from the existing network. It will also be supplying electricity to areas that do not have this basic service.	N – High	High risk

8.3 Cumulative impacts

Cumulative impacts can result from actions which may not be significant on their own but which are significant when added to the impact of other similar actions. The anticipated cumulative impacts of this development include the following:

- **Spread of alien vegetation**

Disturbance during construction will result in more alien plant species occurring on site as such plant species proliferate in disturbed areas.

- **Increased socio-economic upliftment as a result of the proposed development**

Constructing the proposed substation will result in direct jobs being created during the construction phase. During the operational phase, the supply of electricity will be allowed to the local communities in the area and reduce the pressure on the existing grid. This will in turn assist Eskom in achieving their mandate of providing affordable electricity.

- **Destruction or degradation of protected plants and plants of conservation concern**

Loss of functionality of protected plants and plants of conservation concern, as well as erosion due to edge effects can occur as a result of the proposed development. If mitigation measures are adequately implemented, no cumulative impacts are expected.

- **Direct impact on species richness and loss of habitat (fauna)**

Construction and operational activities may result in cumulative impact to the traditional migration routes of mammals, reptiles and especially frogs on the study site and on adjacent properties. Altered population dynamics of natural indigenous species could cause significant impact on overall faunal community structure and alter natural food-chains. It is imperative that effective protective measures should be put into place to protect wetlands and their buffer areas. The increased roads and traffic will definitely cause permanent disruption of migration routes unless mitigation takes place.

Responsible environmental management will be required during the entire project life cycle. These management measures should be guided by the Generic Environmental Management Programme (EMPr) attached as **Appendix F**.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Summaries of Specialist findings

9.1.1 Terrestrial Ecology

The majority of the project area comprised of degraded bushveld, which has been impacted upon by anthropogenic related activities, while wetland features were found to traverse the northern portion of the project area and retains a medium functionality. As such it is important that the management outcomes presented above be adhered to, in order to properly mitigate the negative environmental impacts that will stem from the project activities.

During the field assessment 1 species of protected trees were observed: *Sclerocarya birrea subsp. caffra* (Marula). It is of importance that permit applications be done prior to the commencement of the development, and, should a permit be granted, that all permit requirements are met.

Completion of the terrestrial biodiversity assessment led to a disputing of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The project area is instead assigned an overall sensitivity of 'Medium' and 'Low'.

The degraded Bushveld habitat that is classified as having a sensitivity rating of "Low" is likely to face minimal further impacts from any development activities in terms of terrestrial ecology. As such, it is the specialist's opinion that the proposed project can proceed on the condition that the recommendations made within this report as well as the prescribed mitigation measures be adhered to.

9.1.2 Wetland Assessment

Three HGM units were identified within the 500 m regulated area, namely, an unchanneled valley bottom, a channelled valley bottom, and a hillslope seep.

The average ecosystem service scores range from "Intermediate" to "Moderately High". Ecosystem services contributing to these scores include flood attenuation, streamflow regulation, sediment trapping, phosphate assimilation, nitrate assimilation, toxicant assimilation, erosion control, biodiversity maintenance.

The delineated wetland systems have been scored overall present ecological state ratings of "Largely Modified" (class D). The importance and sensitivity score of the delineated wetlands is moderately sensitive. A 15 m buffer zone has been calculated and recommended for the proposed substation.

It is recommended that the wetland features identified to have a "medium" sensitivity be avoided as far as possible. As per the SEI guidelines, only development activities of medium impact followed by appropriate restoration activities will be acceptable within the areas designated as medium sensitivity (Wetland). As such it is imperative that the mitigation measures mentioned in this report be implemented and adhered to.

Several moderate residual risks were identified in the water resource risk assessment. The project area will result in the loss of 3.989 ha of wetland area. In regard to the mitigation hierarchy, it has been recommended that an offset strategy be implemented for the project to compensate for the partial loss of wetland area, and the associated degradation of the affected systems unless the project design be designed to avoid these wetland areas and

associated buffers. Mitigation measures have been prescribed for other aspects seeking to avoid impacts with the implementation of the buffer areas, and to mitigate any indirect risks posed by the project.

9.1.3 Heritage Impact Assessment

The field assessment identified some sites & features of cultural heritage (archaeological/historical) origin in the study area. Most of these are however individual scatters of material (pottery, grinding stones) and of very low cultural heritage (archaeological and/or historical) significance. There is however a few with higher significance (APAC, 2022).

The area has been ploughed over the years, and as a result if any sites did occur here it would have been extensively disturbed or destroyed. Individual pieces and small scatters of undecorated pottery were noticed across the area, while out of context upper grinding stones were also identified. This is of course evidence of earlier settlement in the area that has all but been destroyed. Traces of this settlement can however still be present underground. Pieces of building material (cement/concrete) found is also further evidence of this, while the communal grinding hollows found on the rocky outcrop in the area substantiates this (APAC, 2022).

The proposed site contains a fairly dense scatter of undecorated pottery, metal, porcelain and glass objects, located on an open area that could possibly denote an old refuse midden close to homestead (no physical evidence for the homestead remains). What makes this site very significant however is the scatter of metal slag (evidence for metal smelting and working). A fragment of a clay blow pipe (used in the metal smelting furnaces) was also found on the site. The age of these remains possibly date to the Late Iron Age (LIA), with some later historical settlement on the site as well. A stone cairn found close by (initially thought to be a possible grave is more likely a granary platform. Similar open patches were noticed in the study area, but very little material was found at these locations except for one or two pieces of pottery. It is possible that these open areas could be evidence of earlier homesteads that has been destroyed by recent farming activities (APAC, 2022)

From a heritage point of view, it is recommended that the proposed project be allowed to continue on acceptance of the mitigation measures and conditions presented in the report.

9.1.5 Palaeontological Impact Assessment

This area falls on the Nelspruit Suite, with a Very Low Palaeontological Sensitivity, therefore it is a No-Study. The likelihood of finding fossils is zero. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or drilling for foundations have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

9.2 Impact Summary of the alternatives

The **Table 14** below gives an overall summary of the preferred alternatives for each component of the development as a result of the comparative assessment undertaken in Table 6 and 7. According to the above table, overall a collective significance of impacts would be less for Option 1

Table 15: Construction and operational Phase Impacts

Nature of Impact	Construction Phase	
	Without Mitigation	With Mitigation
Vegetation and habitat	48 (Medium)	22 (Low)
Loss of agricultural land	55 (Medium)	40 (Medium)
Removal/ Destruction of protected plants and plants of conservation concern	55 (Medium)	40(Medium)
Soil erosion	48 (Medium)	21 (Low)
Surface water contamination and degradation	60 (Medium)	36 (Medium)
Changes in water quality due to input of foreign materials.	60 (Medium)	36 (Medium)
Loss of wetland	55 (Medium)	45 (Medium)
Degradation of the soil	33 (Medium)	8 (Low)
Increased risk of damage due to unmanaged fires	21 (Low)	8 (Low)
Water resource pollution and Contamination	55(Medium)	36 (Medium)
Potential increase in alien and invasive vegetation	40 (Medium)	21 (Low)
Dust Generation	36(Medium)	18(Low)
Contamination of fauna environment	27 (Low)	14 (Low)
Crime, safety and security	27 (Medium)	21 (Low)
Noise	33(Medium)	12 (Low)
Traffic and accessibility	33 (Medium)	14 (Low)
Loss and disturbance of heritage sites	36 (Medium)	16 (Low)
Loss and disturbance to palaeontology	8 (Low)	8 (Low)
Visual	55(Medium)	36(Medium)

Pollution due to inappropriate handling of generated waste on site	48 (Medium)	18 (Low)
Socio-economic	24 (Low)	50 (Medium)
Nature of Impact	Operational Phase	
	Without Mitigation	With Mitigation
Maintenance activities resulting in the loss of flora and fauna	50(Medium)	40 (Medium)
Loss of agricultural land	32 (Medium)	40 (Medium)
Removal / Destruction of protected plants	40 (Medium)	24 (Low)
Soil erosion	40 (Medium)	21(Low)
Surface water contamination and degradation	40 (Medium)	18 (Low)
Degradation of the soil due to hazardous substance spillages	24 (Low)	10 (Low)
Increased risk of damage due to unmanaged fires	27 (Low)	12 (Low)
Water resource pollution and Contamination	33 (Medium)	10 (Low)
Potential increase in alien and invasive vegetation	30 (Low)	10 (Low)
Increased dust generation due to maintenance activities	12 (Low)	8 (Low)
Contamination of fauna environment	30 (Low)	16 (Low)
Noise Impacts	16 (Low)	12 (Low)
Electricity Supply	60 (Medium)	75 (High)
Loss and disturbance of heritage sites	8 (Low)	8 (Low)
Loss and disturbance to palaeontology	8 (Low)	8(Low)
Visual	60(Medium)	50(Medium)
Increase in theft of electrical cables	24 (Low)	14 (Low)

Pollution due to inappropriate handling of generated waste on site.	21 (Low)	8(Low)
Mortality of SCC and non-SCC priority species due to collision with the 20m 132 LILO powerline conductors/earthwires	24 (Low)	9(Low)
Mortality of SCC and non-SCC priority species as a result of electrocution on the 132 kV LILO infrastructure.	52 (Medium)	6(Low)
Mortality of SCC and non-SCC priority species as a result of electrocution within the Nkambeni Substation.	20(Low)	6(Low)
Socioeconomic	60 (Medium)	75(Low)

9.3 Conclusion_(Impact Statement)

The findings of the specialist studies undertaken within this Basic Assessment to assess both the benefits and potential negative impacts anticipated as a result of the proposed project conclude that there are **no environmental fatal flaws** that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. The significance levels of the majority of identified negative impacts have been reduced by implementing the mitigation measures recommended by the specialist team during the Basic Assessment Process, and this specifically included the consideration of the facility layout in relation to sensitivities identified.

The project will result in some unavoidable environmental impacts during construction but this is not a fatal flaw. The nature of the project has been planned in such a way that there are minimal negative environmental impacts. None of these adverse impacts are considered unacceptably significant and all can be managed to acceptable levels through the effective implementation of the recommended mitigation measures. In addition, the project will provide benefits to the local community in terms of service provision. The project has considered constraints, and is considered to meet the requirements of sustainable development. Environmental specifications for the management of potential impacts are detailed within the Generic Environmental Management Programme (EMPr) for the Nkambeni substation and LILO development included within **Appendix F**.

Environmental cost that can be expected to arise as a result of the project proceeding for all alternatives include: Disturbance of the vegetation and fauna: Vegetation and fauna (including avifaunal) habitats may be slightly disrupted and there will be loss of the wetland identified in the proposed site

Benefits of the project include the following:

- The proposed development provides a basic need and service to the local communities within the area.
- The proposed development will result in important economic benefits at the local and regional scale through job creation, procurement of materials for construction and provision of services and other associated economic development at local and regional scale. These will extend beyond the site and would be experienced at local and regional scale.
- Overall community upliftment will occur as a required service will be fully functional in operation.

The benefits of the project are expected to outweigh the costs.

Based on the assumption Envirolution believes through effective implementation of the stipulated mitigation measures, the adverse impacts can be reduced. With the proposed mitigation measures, DFFE may agree that the project's benefits outweigh the potential negative impacts.

9.4 Recommendations

Envirolution Consulting (Pty) Ltd thus suggests the approval of the proposed Nkambeni Substation (Preferred) as outlined and discussed above, be considered for approval subject to the following general recommendations:

1. The removal of protected plant species should be avoided where possible. Where required, necessary permits/ approvals must be in place and rehabilitation must be ensured.
2. Should archaeologically sites or graves be exposed during further construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in the Generic EMPr.
3. A Fossil Chance Find Protocol should be in place.
4. Implementing the Generic EMPr to guide construction and operational activities to provide a framework for the on-going assessment of environmental performance.
5. Water Use License: The relevant authorisations and water use licenses must be obtained from the DWS prior to the commencement of construction activities since the proposed site falls within the 500m regulated buffer and wetlands were identified on site
6. No development other than the authorized activities will be allowed within a wetland or buffer of the wetland measured from the edge of the wetland, or any other sensitive environmental area.
7. A rehabilitation plan must be compiled and implemented for all wetland systems within the project area that will be indirectly impacted on by the project; and,
8. It is recommended that a wetland offset strategy be implemented to compensate for the loss and degradation of unchanneled valley bottom wetland (HGM 1).
9. An independent ECO must be appointed/ designated to ensure that regular inspections are performed during the construction phase and to ensure the implementation of mitigation measures. Furthermore, an ECO must monitor compliance with all the conditions of the Generic EMPr and the environmental authorization once issued.
10. It is recommended that the wetland features identified to have a "medium" sensitivity be avoided as far as possible. As per the SEI guidelines, only development activities of medium impact followed by appropriate restoration activities will be acceptable within the areas designated as medium sensitivity (Wetland). As such it is imperative that the mitigation measures mentioned in this report be implemented and adhered to.
11. There is continued consultation with relevant stakeholders/landowner through an appointed community liaison officer during construction.
12. Reports on the status of construction and legal compliance are submitted to DFFE at stipulated intervals.
13. Clearance of the area should be as minimal as possible and construction activities be confined to areas where construction will take place (development footprint) to prevent negative impacts onto the surrounding environment.
14. Avoid, as far as reasonably possible, disturbing the wetlands. Similarly, restore wetlands that will remain intact if they have been affected by construction activity – where applicable.
15. Adequate measures must be put in place to prevent polluted runoff water from entering wetlands, soil and other sensitive environmental areas, thus preventing surface and groundwater pollution.

16. Servicing/maintenance/washing of vehicles must not be carried on the construction site and only emergency repairs can be done on site.
17. In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of Section 30(3) of NEMA.
18. Construction noise on site must not exceed 85 decibels (DB) as stipulated in the Occupation Health and Safety Act (Act No. 85 of 1993).
19. All relevant legislation and requirements of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
20. Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by DFFE.
21. Maximise the employment of local people and the procurement of local resources during the construction and maintenance phases to ensure maximum benefit to the provincial/local economy.
22. Implement the recommendations made in the specialist studies and Generic EMPr.
23. The Generic EMPr should form part of the contractor's tender documentation.
24. Period for which the Environmental Authorisation is Required: The Environmental Authorisation is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/ EAP will be required to provide a detailed motivation on what the period of validity should be

10 APPENDICES

The following appendixes are attached:

Appendix A: Site plan(s)

- Appendix A1: Locality Maps
- Appendix A2: Sensitivity Maps

Appendix B: Site Photographs

Appendix C: Facility Illustrations

Appendix D: Specialist Studies

- Appendix D1: Terrestrial Biodiversity Compliance Statement and Water Resource Assessment
- Appendix D2: Heritage Impact Assessment
- Appendix D3: Palaeontological Site Verification

Appendix E: Public Participation Process

- Appendix E1: Site Notices
- Appendix E2: Newspaper Advertisement
- Appendix E3: Written notifications
- Appendix E4: Authority Consultation
- Appendix E5: Comments on the Draft BA Report
- Appendix E6: Minutes of meetings
- Appendix E7: Comment & Response Report
- Appendix E8: I&APs Database

Appendix F: Generic Environmental Management Programme (EMPr)

Appendix G: Other Information

- Appendix G1 – Basic Assessment Report (2016)
- Appendix G2 – Existing Environmental Authorization
- Appendix G3-Part 2 amendment Report
- Appendix G4 – Amended Environmental Authorization
- Appendix G5- Screening Report
- Appendix G6- Details of EAP (and expertise) and Affirmation