DRAFT BASIC ASSESSMENT REPORT

DEVELOPMENT OF THE ESKOM MESONG 400Kv LOOP IN LOOP OUT POWERLINE PROJECT, GAUTENG PROVINCE

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

DEVELOPMENT OF THE ESKOM MESONG 400Kv LOOP IN LOOP OUT POWERLINE PROJECT, GAUTENG PROVINCE

DFFE REF: 2021-06-0018

DRAFT BASIC ASSESSMENT REPORT

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PROJECT TEAM

CES has been appointed by Eskom Holdings SOC Ltd as independent consultants to undertake a Basic Assessment (BA) process for the Proposed Development of the Mesong, 400Kv loop in loop out transmission line of the Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS) in the Gauteng Province, as required by the NEMA EIA Regulations, 2014 (as amended 2017). The BA process is largely dependent on the information and assessments provided by the independent specialists and the input received during the public participation process in order to inform the overall environmental assessment of the proposed development on both environmental and social aspects.

The process where the environmental impacts associated with a project are assessed is a collective effort from a team of appropriate and independent specialists, as well as an independent Environmental Assessment Practitioner (EAP). The EIA is required to assess the planned development from a holistic perspective, considering all aspects and characteristics within the affected natural and social environment.

The following specialist consultants have provided expert input and a detailed assessment of the project in order to assess the environmental and social impacts within the affected environment as well as the acceptability of the application.

CES team and responsibilities

CES TEAM MEMBER	PROJECT RESPONSIBILITIES
Dr Ted Avis	**Environmental Assessment Practitioner**
Mr Gregory Shaw	**Project Leader, Report Reviewer**
Mr Aidan Gouws	**Project Manager, Public Participation Manager**
Peter Bally	**Lead Report Writer**

EXECUTIVE SUMMARY

BACKGROUND

Eskom Holdings SOC Ltd proposes the development of the 400 kV Mesong powerline of the Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS) in the Gauteng province. The project is aimed at improving the transmission network supply in Johannesburg East in the Gauteng Province due to the increasing energy demand. CES has been appointed by Eskom Holdings SOC Ltd as an independent Environmental Assessment Practitioner (EAP) to undertake a Basic Assessment (BA), including specialist studies, and apply for the necessary Environmental Authorisation (EA) for the proposed project.

LOCATION, SITE AND PROJECT DESCRIPTION

Eskom Holdings SOC Ltd is proposing the development of 2 x 1 km 400 kV loop-in and loop-out (LILO) lines. The proposed 400 kV lines are located within a Strategic Transmission Corridor (STC). The proposed LILO is located near Kempton Park West on the boarder of Johannesburg and Ekurhuleni. (Figure 1).

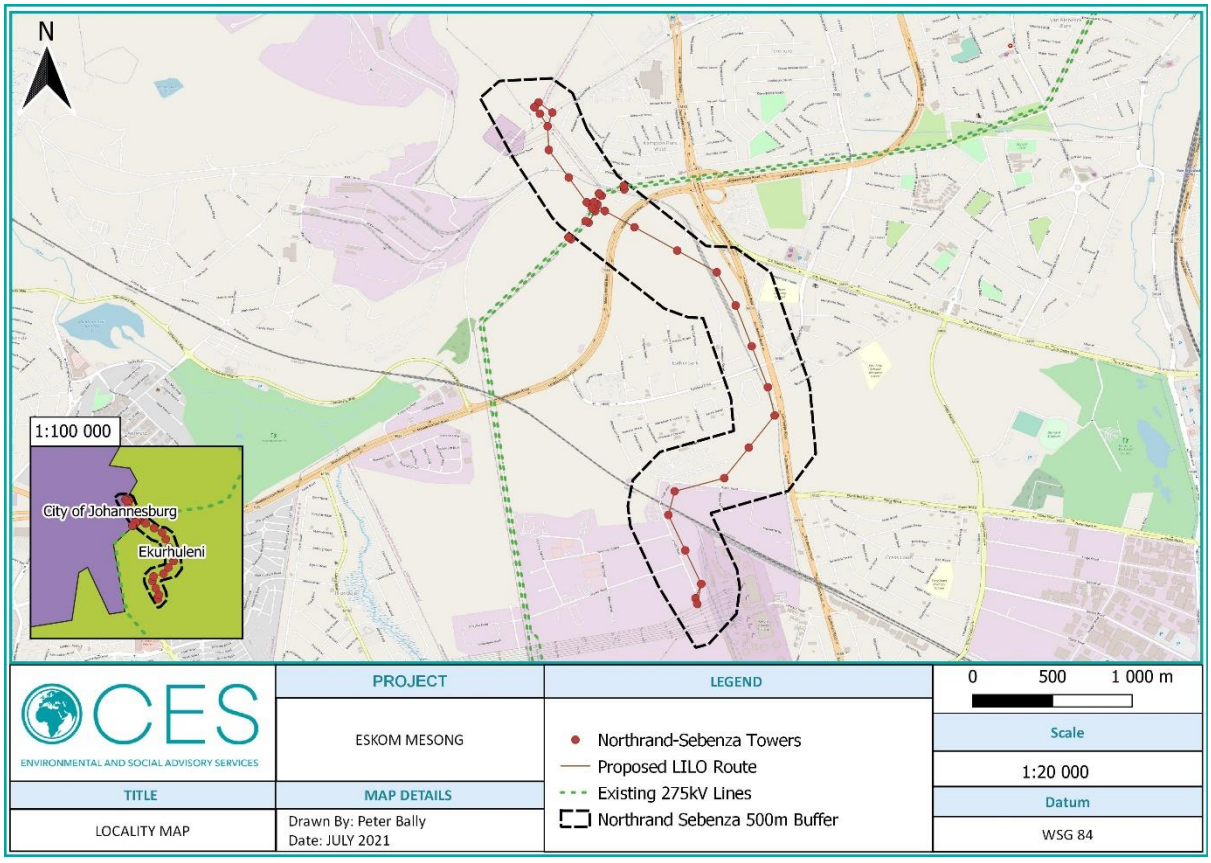

Figure 1: Locality Map of the proposed ESKOM Mesong 400Kv Loop in Loop -out Powerline

In terms of the Environmental Impact Assessment (EIA) regulations of 2014 (as amended), the ESKOM Mesong 400Kv Loop-in Loop-out Powerline project requires an Environmental Authorisation, from the National Department of Environment, Forestry and Fisheries (DFFE). The triggered activities are listed

under Listing Notices 1 (published in Government Notices No. R 983), and as such, the BA Process needs to be followed. The listed activities that have been applied for are provided in Table 1 below.

Table 1: Listed Activities triggered in the 2014 NEMA EIA Regulations (as amended 2017) - (Basic Assessment)

ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
GN R 983 – Listing 1		
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (ii) Inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	The project entails the development of a 2 x 1 km 400 kV loop-in and loop out (LILO) powerlines for the transmission and distribution of electricity. The powerlines will fall partly within an existing transmission line servitude and entirely within the urban edge of the City of Johannesburg and City of Ekurhuleni Metropolitan Municipalities.
GN R 985 – Listing 3		
12	The clearance of an area of 300 square metres or more of indigenous vegetation. c. Gauteng ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;	The project will require the clearance of 450 m^2 of indigenous vegetation within a Critical Biodiversity Area (CBA) and 450 m^2 within an Ecological Support Area (ESA).

PUBLIC PARTICIPATION PROCESS

Public consultation is a legal requirement throughout the BA process. The Public Participation Process included:

- Placing notice boards on site;
- Identifying and registering Interested and Affected Parties (I&APs) and relevant stakeholders;
- Providing notice to I&APs and stakeholders of the intent to submit an application for EA and the release of the Draft Basic Assessment Report (BAR) for public review.
- Publishing an advertisement in a local newspaper notifying the public of the release of the Draft BAR for public review;
- Keeping a register of all comments by and responses to registered I&APs and stakeholders for inclusion in the Final BAR.

SITE SENSITIVITY

A site sensitivity analysis has been conducted based on specialist and general site information gathered. The project site falls within an area of low agricultural sensitivity, very low to moderate terrestrial biodiversity sensitivity, low archaeological sensitivity, and moderately low to moderate aquatic biodiversity sensitivity.

IMPACT ASSESSMENT

Overall, the table below indicates that there are several potential negative impacts (environmental costs) associated with the proposed LILO powerlines. The significance of most of these impacts can be reduced to an acceptable level by implementing appropriate mitigation measures.

There are a few positive impacts (benefits) associated with the proposed development. These relate primarily to the socio-economic aspects of the project, e.g. job creation, indirect economic benefits

and the improvement in the energy supply. Based on the below analysis it can be seen that pre-mitigation, there is three negative impacts of HIGH significance, 42 of MODERATE significance, 21 of LOW significance and one of VERY LOW significance. After mitigation there are no negative residual impacts of HIGH or MODERATE significance, with 53 of LOW significance and 14 of VERY LOW significance.

Table 2: Summary of impacts before and after mitigation across phases.

IMPACTS	BEFORE MITIGATION				AFTER MITIGATION	
	VERY LOW	LOW	MOD	HIGH	VERY LOW	LOW
Policy and Legislation				-3		-3
Built Environment		(+1)	-9			-9 (+1)
Social		(+3)	-11			-11 (+3)
Rehabilitation			-3			-3
Agricultural		-1				-1
Archaeological		-4				-4
River and Wetland		-6	-1		-6	-1
Terrestrial Ecology	-1	-10	-18		-8	-21
Total	**-1**	**-21 (+4)**	**-42**	**-3**	**-14**	**-53 (+4)**

CONCLUDING REMARKS AND RECOMMENDATIONS

It is the professional opinion of CES and specialists that:

- NO FATAL FLAWS are currently associated with the proposed development, as all identified impacts can be adequately mitigated to reduce the risk or significance of impacts to an acceptable level, provided mitigation measures recommended in this report are implemented and maintained throughout the life of the project.
- If any changes to these layouts are made, the input of the relevant specialist must be obtained and incorporated into any changes.
- The information in the report is sufficient to allow DFFE to make an informed decision

It is the recommendation of CES that the proposed 400Kv loop in loop out transmission line should be approved provided that the proposed mitigation measures are implemented and that the EMPr is implemented, maintained and adapted to incorporate relevant legislation, standard requirements and audit reporting, throughout the life of the development. The mitigation measures for all impacts identified in the BAR must be incorporated into the EMPr and must be used by the engineers during the detailed Planning & Design Phase, by the contractors during the Construction Phase and by Eskom Holdings SOC Ltd during the Operation Phase.

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ACRONYMS

AIS	Alien Invasive Species
BID	Background Information Document
BAR	Basic Assessment Report
CA	Competent Authority
CBA	Critical Biodiversity Area
CES	Coastal and Environmental Services (Pty) Ltd. (t/a CES)
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GN	Government Notice
IDP	Integrated Development Plan
I&AP	Interested and Affected Party
MEC	Member of the Executive Council
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Area
NDP	National Development Plan
PPP	Public Participation Process
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SCC	Species of Conservation Concern
SG	Surveyor General

1 INTRODUCTION

1.1 BACKGROUND

Eskom Holdings SOC Ltd proposes for the development of the 400 kV Mesong loop in loop out transmission line in the Kempton Park West area, in Gauteng. CES has been appointed by Eskom Holdings SOC Ltd as an independent Environmental Assessment Practitioner (EAP) to undertake a Basic Assessment (BA), including specialist studies, and apply for the necessary Environmental Authorisation (EA) for the proposed project.

1.2 PURPOSE OF THIS REPORT

In accordance with the National Environmental Management Act, 1998 (Act No. 107 0f 1998) (NEMA) and the NEMA EIA Regulations (2014), as amended, the issuing of an Environmental Authorisation (EA) requires the undertaking of a BA process, with associated Public Participation Process (PPP) and required specialist studies. This will enable the competent authority to decide whether to issue an EA for the proposed development, and if so, on what conditions. The EIA Regulations (2014) (as amended) allow for a BA process for activities with limited environmental impact (listed in GN R 983 and 985) and a more rigorous two-tiered approach, known as a Scoping/EIA process, for activities with potentially greater environmental impact (listed in GN R 984).

In terms of the EIA regulations of 2014 (as amended), the triggered activity for this project is listed under Listing Notice 1 and 3 (published in Government Notices No. R 983 and No. R 985), and as such, the BA Process will be followed and include the following specialist studies:

- Terrestrial Impact Assessment;
- Aquatic Impact Assessment;
- Heritage Impact Assessment; and;
- Agricultural Impact Assessment.

This report documents the process and findings of the BA for the proposed powerline and associated infrastructure. This report was subject to a public comment period after which it was finalised and hereby submitted to the competent authority for review.

1.3 DETAILS AND EXPERIENCE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

In fulfilment of the legislative requirement (see Section 4.1 below) the details of the EAP that prepared this Basic Assessment Report (BAR) as well as the expertise of the individual members of the study team are provided below.

CES was established in 1990 as a specialist environmental consulting company based in Grahamstown, with branches in East London, Cape Town, Port Elizabeth and Centurion. CES has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, and state of environment reporting (SOER), Integrated Waste Management Plans (IWMP), Spatial

Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. CES has been active in all of the above fields, and in so doing have made a positive contribution to towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries.

Dr Ted Avis *(Role: Environmental Assessments Practitioner [EAP])*
Ted Avis is a leading expert in the field of Environmental Impact Assessments, having project-managed numerous large-scale ESIAs to international standards, especially those of the International Finance Corporation (IFC). Ted also has experience in large scale Strategic Environmental Assessments in southern Africa and has been engaged by the IFC on a number of projects. Between 1994 and 1996 Ted was instrumental in establishing the Environmental Science Department at Rhodes University, whilst a Senior lecturer in Botany at that time. This resulted from his experience running honours modules in EIA practice and environmental management, as well as the applied research he undertook in these disciplines. He was an Honorary Visiting Fellow in the Department of Environmental Sciences at Rhodes between 1998 and 2003. He was one of the first certified Environmental Assessment Practitioner in South Africa, gaining certification in April 2002. He has delivered papers and published in the field of EIA, Strategic Environmental Assessment and Integrated Coastal Zone Management, and has been a principal of CES since its inception in 1990 and Managing Director since 1998.

Mr Gregory Shaw *(Role: Reviewer)*
Mr Gregory Shaw is a Principal Environmental Consultant and the Business Development Manager at CES. Greg has 12 years' experience in conducting environmental consultancy services in the energy, transport, maritime and agricultural sectors on behalf of South African and oversees government departments and agencies, local government authorities, private developers, international funding organisations, and non-government organisations. He has a strong track record of projects completed within budget, on time and in accordance with national and/or international environmental legislation and guidelines. Greg's skills include ESIA, environmental survey development, management, execution and monitoring, report writing, project management and strategic planning.

Mr Aidan Gouws (*Role: Lead Author)*
Mr Aidan Gouws obtained his MSc in Environmental Science (*Cum laude*) from Rhodes University, having conducted research on the spatio-temporal dynamics of *Acacia dealbata* invasions and broader land-use and cover changes in the northern Eastern Cape, funded through a study bursary awarded by the Agricultural Research Council (ARC). Prior to this, he obtained his BSc Honours in Geographical and Environmental Sciences (*Cum laude*) from the University of Pretoria, studying plant ecology and EIA methodology amongst others. He is also member of the Golden Key Honours Society. Aidan joined CES in 2018 and has been involved in several projects, including Basic Assessments, Full Scoping and Environmental Impact Assessments, Environmental Audits and Resettlement Action Plan (RAP) Audit. He works from the Johannesburg office and his interests include the general Environmental Impact Assessment (EIA) process, GIS mapping, ecological studies and the Public Participation Process (PPP).

Mr Peter Bally *(Role: Author)*
Mr Peter Bally holds a bachelor's (BSocSci) degree in Geopolitics and an Honours degree in Geography from Rhodes University. This gives him a keen interest in both societal and physical changes that occur

across the globe. He has extensive fieldwork experience throughout the Western and Eastern Cape as well as Lesotho both mapping various sites and interviewing various parties. He has professional and freelance experience in the Geospatial industry where he has worked across multiple platforms. He as a passion for both Remote sensing and GIS technology and software. His interests include wetlands dynamics and ecology, geomorphology, biodiversity and Political Ecology. He has experience compiling screening reports, conducting social impact assessments (SIA), and conducting interviews with stakeholders and interested and affected parties in areas of development. He works at CES in the Cape Town offices as an environmental consultant.

Full Curricula Vitae (CV) for individual members of the project team are attached as Appendix F1.

1.4 NATURE AND STRUCTURE OF THE REPORT

The structure of this report is based on Appendix 1 of GN R 982, of the EIA Regulations (2014) (as amended), which clearly specifies the required content of a Basic Assessment Report.

- **Chapter 1** introduces the proposed project and describes the purpose of this report and its structure.
- **Chapter 2** details the project location and describes the proposed project in detail, including primary infrastructure such as the powerline, access roads and electrical distribution infrastructure.
- **Chapter 3** describes the needs and desirability of the project.
- **Chapter 4** describes the legislation that is applicable to the project.
- **Chapter 5** describes the biophysical and social environment of the proposed project site.
- **Chapter 6** describes the Public Participation Process (PPP) undertaken.
- **Chapter 7** provides a description of the alternatives to the proposed development, or components of the proposed development.
- **Chapter 8** covers the impact assessment methodology.
- **Chapter 9** provides a summary of the key findings of the specialist study for the proposed project.
- **Chapter 10** covers the impact assessment for the proposed project.
- **Chapter 11** provides a sensitivity analysis.
- **Chapter 12** provides a summary of the key environmental findings.
- **Chapter 13** provides recommendations and concludes this report.

1.5 SCOPE OF ASSESSMENT AND CONTENT OF THE BASIC ASSESSMENT REPORT

Section 3 of Appendix 1 of GN R982, as amended, specifies the content requirements for a Basic Assessment Report. The table below indicates how this document complies with these requirements.

SECTION 3	NEMA EIA REGULATIONS – APPENDIX 1 REQUIREMENT	SECTION IN REPORT
(a)	details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.2 Appendix A

SECTION 3	NEMA EIA REGULATIONS – APPENDIX 1 REQUIREMENT	SECTION IN REPORT
(b)	the location of the activity, including- (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.1
(c)	a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.1
(d)	a description of the scope of the proposed activity, including- (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section 4.1 and Section 4.2
(e)	a description of the policy and legislative context within which the development is proposed including (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 4.2
(f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 3
(g)	a motivation for the preferred site, activity and technology alternative;	Chapter 7
(h)	a full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered; (ii) details of the PPP undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and	Chapter 7 Chapter 6 and Appendix B Appendix B Chapter 5 Chapter 10, Chapter 11

SECTION 3	NEMA EIA REGULATIONS – APPENDIX 1 REQUIREMENT	SECTION IN REPORT
	(cc) can be avoided, managed or mitigated; (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Chapter 10 Chapter 11 Chapter 8, Chapter 10 and Appendix B N/A Chapter 7 Section 13.3
(i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including - (i) a description of all environmental issues and risks that were identified during the EIA process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 8, Chapter 9, Chapter 10 and Appendix B
(j)	an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Chapter 9, Chapter 10 and Appendix B
(k)	where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 9
(l)	an environmental impact statement which contains— (i) a summary of the key findings of the EIA; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 12 Chapter 10 Chapter 12

SECTION 3	NEMA EIA REGULATIONS – APPENDIX 1 REQUIREMENT	SECTION IN REPORT
(m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Appendix E
(n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 13
(o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 13
(p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 3
(q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r)	an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs; and	Appendix F2
(s)	where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t)	any specific information that may be required by the competent authority; and	N/A
(u)	any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

Eskom Holdings SOC Ltd is proposing the development of 2 x 1 km 400 kV line- loop-in and loop-out (LILO) lines, from the Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS). The proposed powerlines are located within a Strategic Transmission Corridor (STC), near Kempton Park West on the border of Johannesburg and Ekurhuleni Metropolitan Municipalities. Locality details are provided in Table 2.1 below. Figure 2.1 illustrates the project location (A3 Locality map provided in Appendix A1).

Table 2.1. Locality details of the proposed project.

GEOGRAPHICAL ENTITY	LOCATION	
Province	Gauteng	
Metropolitan Municipality	City of Johannesburg and City of Ekurhuleni	
Nearest Towns	Kempton Park (5 km east), Tembisa (8 km north) Sandton (13 km west)	
Ward Number(s)	32 (CoJ), 13 and 17 (CoE)	
Farm portions	• Zuurfontein 33 IR, Portions 16, 26, 125, 129, 141, 143, 152, 331, 425, 427, 429, RE/218, RE/24, RE/391 • Klipfontein 12 IR, Portions RE/2, 96 • Modderfontein 34 IR, Portion RE	
CO-ORDINATES	**LATITUDE**	**LONGITUDE**
EXISTING APO-CRO 106	26°5’21.3”S	28°11’10.8”E
EXISTING APO-CRO 107	26°5’23.0”S	28°11’5.2”E
EXISTING APO-CRO 108	26°5’29.3”S	28°11’2.2”E
EXISTING APO-CRO 109	26°5’32.9”S	28°10’58.3”E
Existing Ese-Jup 70	26°5’33.3”S	28°10’58.9”E
Existing Ese-Jup 71	26°5’29.6”S	28°11’2.9”E
Existing Ese-Jup 72	26°5’23.6”S	28°11’5.8”E
Existing Ese-Jup 73	26°5’22.1”S	28°11’10.9”E
GANTRY 1	26°5’2.5”S	28°10’51.6”E
GANTRY 2	26°5’3.6”S	28°10’50.6”E
SEB 1	26°6’54.3”S	28°11’27.0”E
SEB 2	26°6’55.5”S	28°11’27.4”E
SEB 3	26°6’51.0”S	28°11’28.3”E
SEB 4	26°6’43.5”S	28°11’24.7”E
SEB 5	26°6’35.5”S	28°11’20.8”E
SEB 6	26°6’30.2”S	28°11’22.3”E
SEB 7	26°6’27.2”S	28°11’33.5”E
SEB 8	26°6’20.3”S	28°11’39.0”E
SEB 9	26°6’13.1”S	28°11’44.8”E
SEB 10	26°6’6.7”S	28°11’43.3”E
SEB 11	26°5’57.5”S	28°11’39.7”E
SEB 12	26°5’48.3”S	28°11’36.0”E
SEB 13	26°5’40.8”S	28°11’31.8”E
SEB 14	26°5’35.9”S	28°11’22.8”E
SEB 15	26°5’30.7”S	28°11’13.2”E
SEB 16	26°5’27.0”S	28°11’6.5”E
SEB 17	26°5’25.5”S	28°11’4.9”E
SEB 18	26°5’27.0”S	28°11’4.3”E
TOWER 1	26°5’4.8”S	28°10’54.7”E

TOWER 2	26°5'5.1"S	28°10'51.8"E
TOWER 3	26°5'7.9"S	28°10'53.6"E
TOWER 4	26°5'13.2"S	28°10'53.9"E
TOWER 5	26°5'19.5"S	28°10'58.4"E
TOWER 6	26°5'25.1"S	28°11'2.4"E
TOWER 7	26°5'25.0"S	28°11'4.0"E
TOWER 8	26°5'26.3"S	28°11'3.6"E

2.2 GENERAL SITE OBSERVATIONS

The footprint area of the proposed project is situated on portions of the farm Modderfontein on the property of the AECI Industrial Park within urban industrial zones of Lethabong. The project area has been altered for the most part by past agriculture and more recent human interventions such as digging, surface clearing and refuse dumping. A number of footpaths traverse the site and a large decommissioned refuse dumping site occurs in the area. The ventral part of the site is covered in pioneering species and tall grasses and a dense pocket of Eucalyptus Trees border the site to the west. A railway line forms its northern boundary. Site photographs can be found in Appendix A2.

2.3 TECHNICAL DETAILS

2.3.1 PROPOSED OVERHEAD LINE

The following table provides a preliminary description of the development parameters:

Table 2-2: Summary of development parameters

PARAMETER	SPECIFICATIONS	
Pylons		
Individual pylon footprint	Area	15 m X 15 m (225 m^2)
Number of towers	No.	8
Type of towers	Type	540, 518, 534 tower series
Tower spacing (mean and maximum)	Length	175 m, 400 m
Tower height (mean)	Height	64 m
Conductor attachment height (mean)	Height	20 m
Minimum ground clearance	Height	10 m
Powerlines		
Preferred alternative	Length	2 x 1 km 400 kV loop-in and loop out
Servitudes		
Proposed servitude	Width	55 m
	Area	55 m^2

2.3.2 ACCESS ROADS

The proposed development site can be accessed via existing roads, namely R25, Grens Avenue and North Rand Road. Several existing dirt roads also intersect the site.

2.3.3 EMISSIONS

Nuisance dust as a result of construction activities and general smoke emissions from construction vehicles are not anticipated to exceed acceptable norms, taking into account the relatively short term

of the construction period and the existing use of the site, which accommodates vehicular traffic with similar emissions.

2.3.4 NOISE

Noise generated will be typical construction noise as a result of the movement of hauling trucks and graders. The noise nuisance will be managed in terms of the CEMP and the applicable sections of the Occupational Health and Safety Act (OHSA) and relevant Construction Regulations (CR). Normal construction equipment (trucks, graders, bulldozers, compactors etc.) will be used primarily. Noise levels may reach between 80-85 dBA per 15 m at an anticipated maximum. In the rural environment, such noise levels are expected to be negligible.

2.3.5 POWER SUPPLY

Energy requirements during the construction and operational phases will be met by the Eskom Mesong and Sebenza Main Transmission Stations.

2.3.6 WASTE MANAGEMENT

The below describes the waste management for the construction phase. No waste will be produced during the operational phase.

Solid waste shall be stored in an appointed area in covered, tip-proof metal drums or similar container for collection and disposal. Disposal of solid waste shall be at a licensed landfill site or at a site approved by the relevant authority in the event that an existing operating landfill site is not within reasonable distance from the project area. No waste shall be burned or buried at or near the project area. All solid waste (inert earth material) or construction camp wastes (domestic wastes) will be collected at a central location and will be stored temporarily (less than 89 days) (storage for greater than 90 days will incur waste licence activities. Waste will not be stored for longer that) until it can be removed to an appropriately permitted municipal landfill site near the construction site. The contractor must make all attempt to follow the waste hierarchy in dealing with wastes produced (i.e. landfilling should be the final option and not the first response to treatment of any material). No littering by construction workers shall be allowed. During the construction period, the various contractor's facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites. The opportunity for recycling and reuse of construction and demolition waste as fill for road embankments, land reclamation and drainage control must first be explored and take priority before the option of declaring these materials a 'waste'. The contractor is encouraged to actively engage with authorities and landowners adjacent to the site and identify where such 'waste' materials can be usefully deployed to repair existing environmentally damaged areas such as erosion dongas.

2.3.7 STORMWATER MANAGEMENT

Stormwater will be managed in accordance with the best practice guidelines.

2.3.8 WATER USE

Approximately 400 litres per month will sourced from the Ekurhuleni municipal water supply during the construction phase. No water will be required during the operational phase.

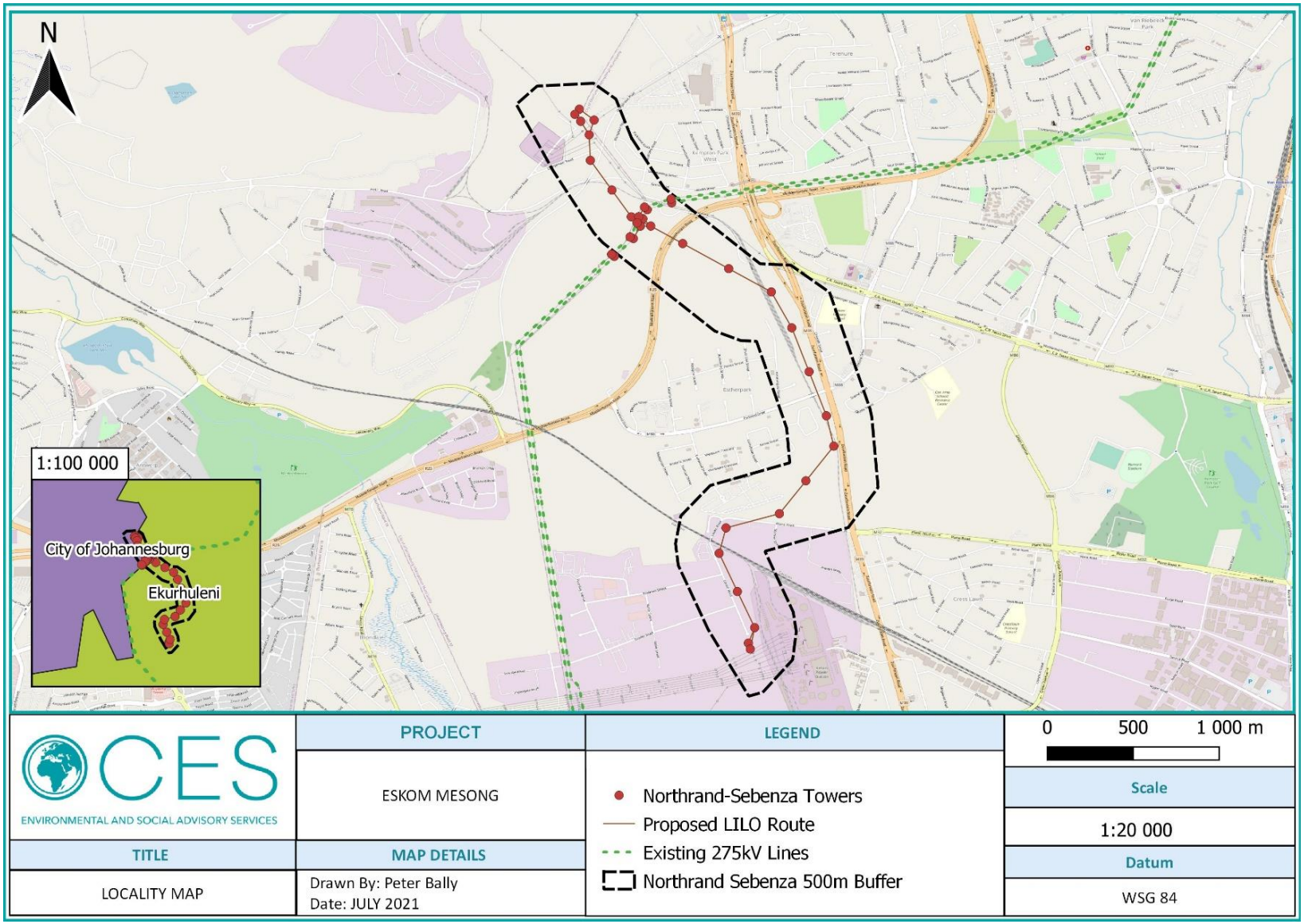


Figure 2.1: Location Map of the proposed Mesong 400kV LILO, Gauteng

3 PROJECT NEED AND DESIRABILITY

The need and desirability of the proposed powerline were evaluated in terms of the Integrated Environmental Management Guideline on Need and Desirability (General Notice 891 of 2014, as amended). This guideline outlines the legislative, strategic and statutory considerations for identifying and describing the need and desirability of proposed developments, which trigger NEMA listed activities. The need and desirability of a proposed development is described in terms of its ecological sustainability, socio-economic justifiability and overall contribution to sustainable development. The following considerations were taken into account in determining the need and desirability of the proposed powerline.

3.1 DEVELOPMENT PLANNING

The National Development Plan (NDP) represents a new approach by Government to promote sustainable and inclusive development in South Africa. The proposed powerline contributes to the NDP goals indirectly by addressing climate change commitments through the reduced reliance on carbon-based power generation.

3.2 INFRASTRUCTURE DEVELOPMENT

The **Ekurhuleni** Metropolitan Municipality and **City of Johannesburg** Metropolitan Municipality's Integrated Development Plan (IDP) (2020/2021) identifies energy as a key limitation to the development of industry and economic sustainability. The proposed activity does not compromise any of the objectives set within IDP (2020/2021). The proposed project will also be supportive of the IDP's objective of creating more job opportunities.

This proposed powerline will provide the municipality directly with electricity, the sustainable energy produced will feed the society living in that area. The proposed project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by DFFE). Therefore, the proposed powerline would help to address the need for increased and stable electricity supply while also be providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area.

The complexities faced by the city in respect of energy are not just about supply. One of the critical challenges the city faces is the cost and demands of constant maintenance and upgrading of the energy infrastructure within the city, to enable appropriate, secure and reliable distribution – with this challenge worsened by illegal connections, cable theft and vandalism. A proactive approach is needed, supported by citizen involvement – with clear platforms established and advertised for raising incidents of theft or vandalism, and education provided in terms of the negative effects of the above on all members of the community. Approaches need to be identified through which to minimise loss (e.g. securing sub-stations, to prevent easy access to cables; using smart technologies). Incorporating new technologies into future developments may also go some way to address energy management challenges. In addition, the implementation of Smart grids, as a way of managing energy use, is viewed as a critical area for consideration.

3.3 ENVIRONMENTAL MANAGEMENT

The basic needs of landowners and the public were taken into account during the planning phase of the proposed project, which aims to stimulate economic growth, create employment opportunities and make significant contribution towards food security. Minimisation of potential negative impacts and optimisation of potential positive impacts will be ensured by way of effective implementation of the EMPr. Thus, the proposed project is deemed to be socially, environmentally and economically sustainable.

3.4 INTEGRATED ENVIRONMENTAL MANAGEMENT (SECTION 23 OF NEMA)

The general objectives of Integrated Environmental Management were taken into account by considering all the potential negative and positive impacts of the proposed project on both the biophysical and socio-economic environments. In order to avoid potentially significant impacts, specialist inputs were obtained in relation to terrestrial and aquatic ecology. Based on the findings of the specialist studies a number of recommendations / mitigation measures have been identified for consideration in further project design and implementation. The public and authorities were given adequate opportunity to comment on the proposed project and to participate in the Basic Assessment Process.

3.5 RIGHTS OF THE LOCAL COMMUNITY

The project will not affect the rights of the local community. The project developer has ensured community engagement in order to ensure that people's rights are not affected; in fact, Eskom has to supply reliable power to meet the increasing needs of electricity users. Therefore, on a continuous basis, Eskom needs to maintain, construct and upgrade its infrastructure of transmission powerlines and substations. According to Eskom TDP 2010–2019, some of the objectives involve: transmission network strengthening plans and reliability projects, which would ensure that the transmission system reliability and adequacy are sustained as load demand increases on the network.

3.6 BENEFITS AND DRAWBACKS

The project benefits outweigh the negative impacts. Although the project will result in the loss of vegetation and infringe on the natural environment, habitat fragmentation will be minimized due to the proposed site falling on the edge of the natural area. The development will be undertaken in a manner that aims to minimise environmental impacts.

The development will place additional pressure on the existing municipal services (e.g. water). However, these pressures can be alleviated if effectively managed.

The above proposed improvement is due to the increasing energy demand from various land use activities in the region. The advantages of the proposed transmission loop-in and loop-out power lines would include: avoiding current and future possible voltage collapse; contributing towards a more flexible electrical network; improvement in the overall reliability of the electrical systems, which would benefit electricity users in the region; and to sustain economic growth in the Province.

4 RELEVANT LEGISLATION

4.1 ENVIRONMENTAL AUTHORISATION IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution, 1996 (Act No. 108 of 1996).

The primary legislation regulating Environmental Impact Assessment (EIA) within South Africa is the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition to this, NEMA also provides for the formulation of regulations in respect of such authorisations.

The EIA Regulations (2014) (as amended) allow for a Basic Assessment (BA) process for activities with limited environmental impact (listed in GN R 983 & 985, 2014, as amended) and a more rigorous two-tiered approach to activities with potentially greater environmental impact (listed in GN R 984, 2014, as amended). This two-tiered approach includes both a Scoping and EIA process.

In terms of the Environmental Impact Assessment (EIA) regulations of 2014 (as amended), the development of the 400kV ESKOM Mesong powerline project requires Environmental Authorisation, from the National Department of Forestry, Fisheries and the Environment (DFFE). The triggered activities are listed under Listing Notices 1 (published in Government Notices No. R 983), and as such, the BA Process needs to be followed. The listed activities that have been applied for are provided in Table 4-1 below.

Table 4.1: Listed Activities triggered in the 2014 NEMA EIA Regulations (as amended 2017)

ACTIVITY NUMBER	ACTIVITY DESCRIPTION	DESCRIPTION OF PROJECT ACTIVITY THAT TRIGGERS LISTED ACTIVITY
GN R 983 – Listing 1		
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (ii) Inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	The project entails the development of a 2 x 1 km 400 kV loop-in and loop out (LILO) powerlines for the transmission and distribution of electricity. The powerlines will fall partly within an existing transmission line servitude and entirely within the urban edge of the City of Johannesburg and City of Ekurhuleni Metropolitan Municipalities.
GN R 985 – Listing 3		
12	The clearance of an area of 300 square metres or more of indigenous vegetation. c. Gauteng ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;	The project will require the clearance of 450 m^2 of indigenous vegetation within a Critical Biodiversity Area (CBA) and 450 m^2 within an Ecological Support Area (ESA).

The competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 4-1 is the Department of Forestry, Fisheries and Environment. DFFE is required to provide a decision regarding the proposed project based on comments from state stakeholders. This decision has been made in terms of Section 24(C) (3) of the National Environmental Management Act, 1998 (Act No 107 of 1998).

It is important to note that in addition to the requirements for an authorisation in terms of NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity, for example:

- National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- Aviation Act, 1962 (Act No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations (1997).
- NEM: Biodiversity Act, 2004 (Act No. 10 of 2004).
- National Water Act, (Act No. 36 of 1998).

4.2 APPLICABLE LEGISLATION

This section describes the South African (national), provincial and municipal legislation considered during the Basic Assessment process of the proposed development.

4.2.1 NATIONAL

4.2.1.1 The Constitution Act, 1996 (Act No. 108 of 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, "*everyone has the right –*

(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–

(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.".

RELEVANCE TO THE PROPOSED PROJECT

- *The developer has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.*
- *The developer has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.*

4.2.1.2 National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) provides for the basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 4-1) relevant to the proposed development, and likely to be utilised in the process of decision making by DFFE.

Table 4-1: NEMA Environmental Management Principles

Number	Description of Principles
(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be undertaken in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons. Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

In addition, NEMA introduces a new framework for environmental impact assessments, the EIA Regulations (2010), which aims to avoid detrimental environmental impacts through the regulation of specific activity that cannot commence without prior environmental authorisation (discussed in Section 4.1).

RELEVANCE TO THE PROPOSED PROJECT

- *An application for Environmental Authorisation (as triggered by the EIA Regulations 2014 (as amended) will be required. In terms of Section 28, every person who causes, has caused, or may cause significant pollution or degradation of the environment, must take reasonable measures to prevent pollution or rectify the damage caused. The undertaking of various specialist studies, in order to identify potential impacts on the environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.*
- *In terms of the EIA regulations, the construction of the proposed powerline and associated infrastructure will trigger the need for a Basic Assessment process under the NEMA EIA Regulations of 2014 (as amended) in Listing Notice 3 (refer to Section 4.1 for a detailed description of the listed activity applied for).*

4.2.1.3 National Environment Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environment Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of NEMBA are:

(a) within the framework of the National Environmental Management Act, to provide for—
  (i) the management and conservation of biological diversity within the Republic and of the components of such biological diversity;
  (ii) the use of indigenous biological resources in a sustainable manner; and
  (iii) the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;
(b) to give effect to' ratified international agreements relating to biodiversity which are binding on the Republic;
(c) to provide for co-operative governance in biodiversity management and conservation; and
(d) to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the NEMBA. In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations Government Notice R. 152 of 23 February 2007.

RELEVANCE TO THE PROPOSED PROJECT

- *The developer must not cause a threat to any endangered ecosystems and must protect and promote biodiversity;*
- *The developer must assess the impacts of the proposed development on endangered ecosystems;*
- *The developer may not remove or damage any protected species without a permit; and*
- *The developer must ensure that the site is cleared of alien vegetation using appropriate means.*
- *Alien Invasive Species (AIS) Regulations, Government Notice R. 598 of 1st April 2014 are applicable.*

4.2.1.4 National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008)

The National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008) (NEMWMA) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS). The objects of the Act are "*to protect health, well-being and the environment by providing reasonable measures for—*

- *minimising the consumption of natural resources;*
- *avoiding and minimising the generation of waste;*
- *reducing, re-using, recycling and recovering waste;*
- *treating and safely disposing of waste as a last resort;*
- *preventing pollution and ecological degradation;*
- *securing ecologically sustainable development while promoting justifiable economic and social development;*
- *promoting and ensuring the effective delivery of waste services;*
- *remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and*
- *achieving integrated waste management reporting and planning.*"

RELEVANCE TO THE PROPOSED PROJECT

- *The developer must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The developer must consult with the local municipalities to ensure that waste is disposed of at a registered landfill site.*

4.2.1.5 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, "as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed project. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED PROJECT

- *The developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.*

4.2.1.6 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The National Environmental Management: Air Quality Act (No. 39 of 2004)(NEMAQA) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
  - Protection and enhancement of the quality of air in the Republic.
  - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will *inter alia* have to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

RELEVANCE TO THE PROPOSED PROJECT

- *Although no major air quality issues are expected, the developer needs to be mindful of the Act as it also relates to potential dust generation during construction, etc.*

4.2.1.7 National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act (NWA) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act is "*to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors–*

(a) meeting the basic human needs of present and future generations;
(b) promoting equitable access to water;
(c) redressing the results of past racial and gender discrimination;
(d) promoting the efficient, sustainable and beneficial use of water in the public interest;
(e) facilitating social and economic development;
(f) providing for growing demand for water use;
(g) protecting aquatic and associated ecosystems and their biological diversity;
(h) reducing and preventing pollution and degradation of water resources;
(i) meeting international obligations;
(j) promoting dam safety;
(k) managing floods and droughts."

Section 21 of the NWA describes activities defined as a water use under the Act. These activities may only be undertaken subject to the application for, and issue of, a Water Use License (WUL) or General Authorisation (GA). Water use activities include—

(a) taking water from a water resource;
(b) storing water;
(c) impeding or diverting the flow of water in a watercourse;
(d) engaging in a stream flow reduction activity contemplated in section 36;
(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
(g) disposing of waste in a manner which may detrimentally impact on a water resource;
(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
(i) altering the bed, banks, course or characteristics of a watercourse;
(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
(k) using water for recreational purposes."

RELEVANCE TO THE PROPOSED PROJECT

- *Water for the construction and operational phases of the proposed development will be sourced from the Municipality line that is currently supplying Johannesburg East in the Gauteng Province.*
- *The specific supply should have a separate meter for any other logistical purposes. This water may require temporary storage on site, triggering the need for a Water Use Authorisation (WUA) under the National Water Act (NWA), (Act No 36 of 1998) Section 21 for the following water use: 21(b) for the storage of water.*

4.2.1.8 National Road Traffic Act, 1996 (Act No. 93 of 1996)

The National Road Traffic Act (No. 93 of 1996) (NRTA) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED PROJECT

- *All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed powerline.*

4.2.1.9 Other Relevant National Legislation

Other legislation that may be relevant to the proposed powerline and associated infrastructure includes:

- The Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters;

- Provincial Nature and Environmental Conservation Ordinance, 1974 (Act No. 19 of 1974), which lists species of special concern which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species.
- Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013 – came into force on 1 July 2015) (SPLUMA) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.

4.2.2 PROVINCIAL

4.2.2.1 Gauteng Biodiversity Plans

The Biodiversity Plan is a useful tool for addressing the need to take biodiversity into account in land use planning and decision-making, in order to promote sustainable development. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), with accompanying land use planning and decision-making guidelines.

RELEVANCE TO THE PROPOSED PROJECT

- *The proposed development must be aligned with provincial spatial planning guidelines and targets.*
- *The developer must not cause a threat to any endangered ecosystems and must protect and promote biodiversity.*
- *The developer must assess the impacts of the proposed development on endangered ecosystems.*

4.2.2.2 The Gauteng Integrated Energy Strategy

The Gauteng Integrated Energy Strategy (GIES) was developed in response to the challenges associated with global climate change, the global economic meltdown and the electricity crisis in South Africa. The strategy aims to improve Gauteng's environment, reduce Gauteng's contribution to climate change and tackle energy poverty, whilst at the same time promoting economic development in the province. The purpose of the Gauteng Integrated Energy Strategy and Implementation Plan is to direct the way that energy is supplied and used within the Gauteng province during the next 4 years (2014); 15 years (2025); 45 years (2055) and beyond, in an integrated and sustainable manner. This will be done by advancing and driving energy efficiency and supporting an energy supply mix that includes renewable energy technologies across the province. Within Gauteng, solar energy (solar water heaters) and energy from landfill gas are the most obvious short term renewable energy sources with the potential to buy renewable energy from wind and concentrated solar power from outside the provincial boundaries.

In 2055 it is envisaged that Gauteng will be powered by a low carbon economy with a significant share of national "green jobs", where citizens have accessible, affordable, safe and efficient energy services and integrated public transport that do not impact on the health of people or the environment.

4.2.3 DISTRICT

4.2.3.1 Ekurhuleni Metropolitan Municipality Environmental Management Framework

Section 24 of the Constitution provides that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- prevent pollution and ecological degradation;
- promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Ekurhuleni Metropolitan Municipality in delivering services to the community strives to maintain and promote sustainable environmental management by carefully blending ecological, social, and economic considerations into our future planning and decision-making processes. The Ekurhuleni Metropolitan Municipality will balance the interests of the present with those of future generations, and ultimately, will strive to reduce the environmental impacts of current operations, activities, products, and services.

To meet the goals and intended outcome of the Environmental Policy seven areas of impact are defined that require implementation. The long term outcomes are:

- Key natural resources are protected and conserved
- EMM employees are aware of environmental matters and environmental education initiatives are implemented
- Environmental principles are embedded in Infrastructure and development activities in EMM
- Land, water and air pollution is prevented and reduced
- Catchments are managed in an integrated manner
- EMM is energy efficiency and has adapted to climate change impacts
- Sound environmental governance

RELEVANCE TO THE PROPOSED PROJECT

- *The proposed development must be aligned with Metropolitan spatial planning guidelines and targets.*

4.2.3.2 Johannesburg Metropolitan Municipality Environmental Management Framework

The City of Johannesburg has over the years evolved into being South Africa's chief industrial and financial metropolis. According to the 2001 census Johannesburg is regarded as the largest city in South Africa as it is home to 3.2 million people living in an estimated 1 million households and of which 212 211 are in informal households. It is a known fact that high population growth coupled with industrial and economic development is a source of stress to the earth's finite natural systems and resources.

The overarching goal is to establish an institutional framework that empowers local government, and other stakeholders to make environmental decisions that meet the needs of people and ecosystems with equity and balance with the following objectives:

- Promote and facilitate the integration of environmental issues in planning policies, plans, programmes and to the day-to-day operational programs of the city.
- Promote informed decision-making that is taking into consideration cumulative impacts and environmental limits.
- Reduction of the city's negative impacts.
- Reduction of the city's risk and liabilities.
- To regularly report on the city's state of the environment.
- Establishment of an Environmental Management System based on ISO 14001
- To conduct compliance monitoring of the city's operations to legislative obligations.

4.2.4 OTHER

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the EIA. However, for the purposes of completeness, these include:

- Gauteng Development Framework
- Gauteng Spatial Development Framework
- Ekurhuleni Metropolitan Municipality Spatial Frameworks
- Johannesburg Metropolitan Municipality Spatial Frameworks
- Ekurhuleni metropolitan Municipality By-Laws
- Johannesburg Metropolitan Municipality By-Laws
- Ekurhuleni metropolitan Municipality Integrated Development Plans
- Johannesburg Metropolitan Municipality Integrated Development Plans

In addition to the above, the following spatial tools from the South African National Biodiversity Institute (SANBI) need to be taken into consideration:

- The South African Vegetation Map (Mucina and Rutherford);
- The Gauteng Conservation Plan
- Ekurhuleni metropolitan Municipality Bioregional Plan
- Johannesburg Metropolitan Municipality Bioregional Plan: and
- The National Freshwater Ecosystem Priority Areas (NFEPA) project.

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter provides a description of the affected environment within the vicinity of the proposed powerline. This information is provided to assist the reader in understanding the possible effects of the project on the environment within which it is proposed to be developed. This information has been sourced from existing information available for the area as well as the specialist consultants who have undertaken studies for the proposed development. This chapter aims to provide the context within which this BA is being conducted.

5.1 BIOPHYSICAL ENVIRONMENT

5.1.1 CLIMATE

The information provided herewith is based on the climate data for Johannesburg – the nearest urban area in proximity to the project area. According to the Koppen Climate Classification, the climate for Johannesburg is classified as 'Bsk' (Mid-Latitude Steppe and semi-arid cool climate). The average annual temperature is 16°C, with the warmest average temperatures recorded in December and January (26°C) and coldest average temperatures recorded in June and July (4°C). Precipitation typically occurs in the summer months. Approximately 543 mm of rain is received per year, with January receiving the highest average precipitation (125 mm) and July receiving the lowest (4 mm) (ClimaTemps, 2021). A summary of the climate at Johannesburg is provided in Figure 5.1 below.

5.1.2 TOPOGRAPHY

Vegetation types are influenced by a range of biotic and/or abiotic factors at different spatial and temporal scales, which together influence the distribution, composition, structure, and diversity of plant communities (Rodrigues *et al.*, 2018). Among the abiotic factors influencing vegetation types, topography (landform), geology, and soils are considered three of the major factors determining habitat heterogeneity and species diversity. The topography of the eastern area is relatively flat, increasing in elevation towards the west of the project area in Figure 5.2 respectively.

5.1.3 GEOLOGY AND SOILS

The geology underlying the project area is characterised by two main geological features, of Halfway House Granite and Basement Complex, the surrounding area includes Dwyka, Black Reef, Klipriver, Vryheid and Hospital Hill geologies (Figure 5.3). The soils within the study site are classified as Haplic Lixisols (Figure 5.4). Lixisols are defined by the presence of a subsurface layer of accumulated kaolinitic clays, where at least half of the readily displaceable ions are calcium, magnesium, sodium, or potassium, but they are also identified by the absence of an extensively leached layer below the surface horizon (uppermost layer).

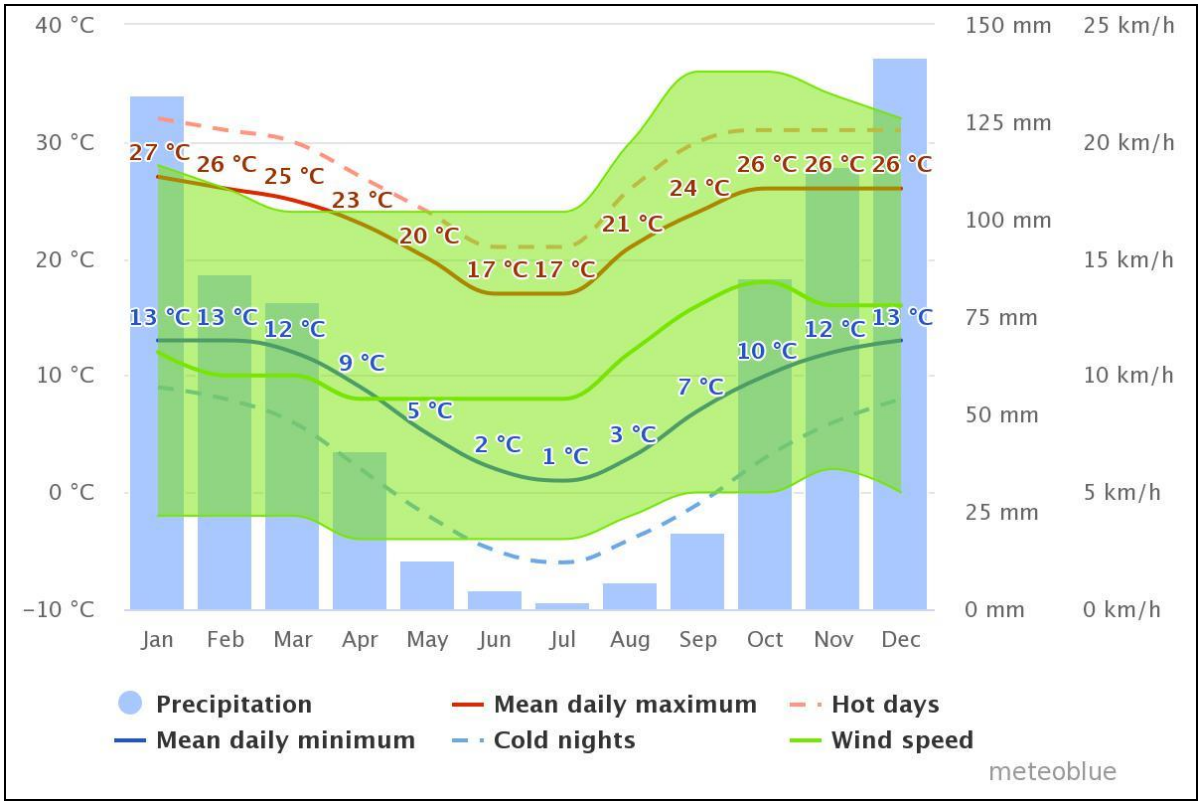


Figure 5.1: Climatic data for Johannesburg, Gauteng (Meteoblue, 2021) .

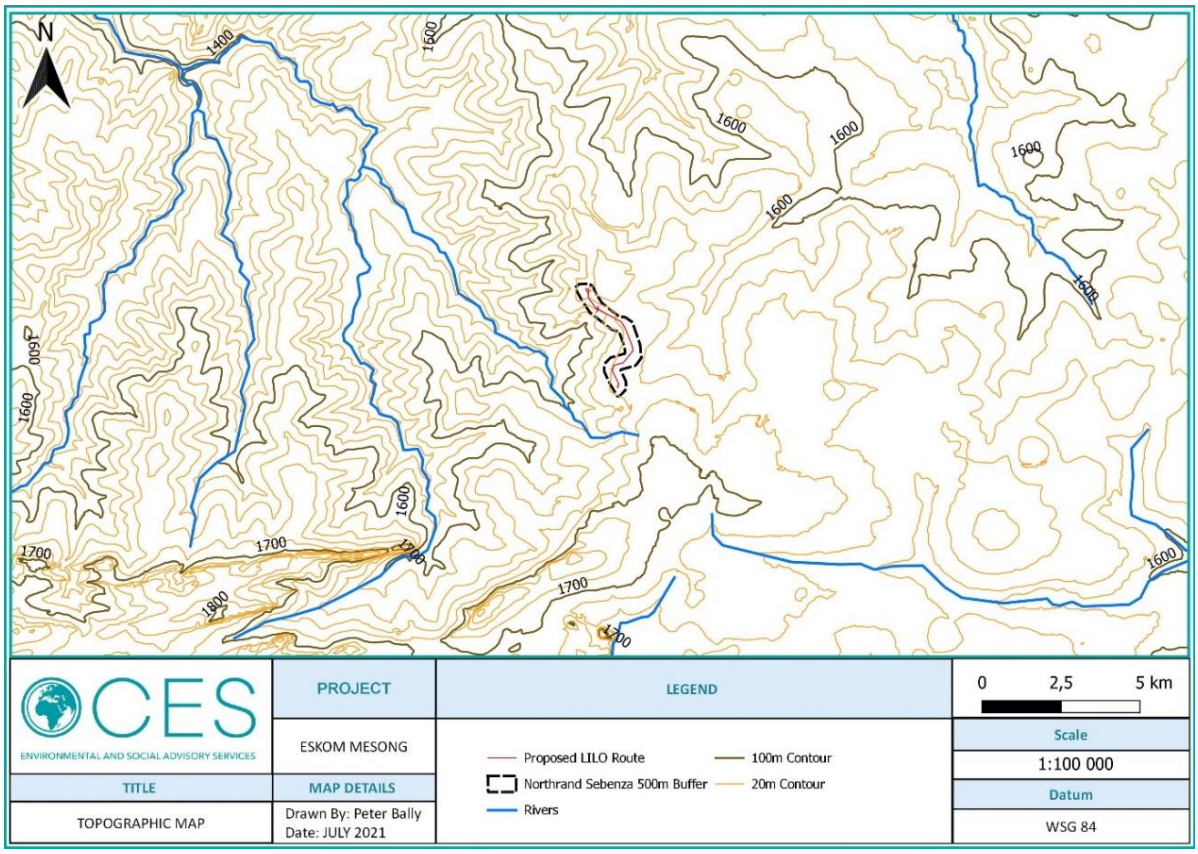


Figure 5.2: Contour Map of the study area

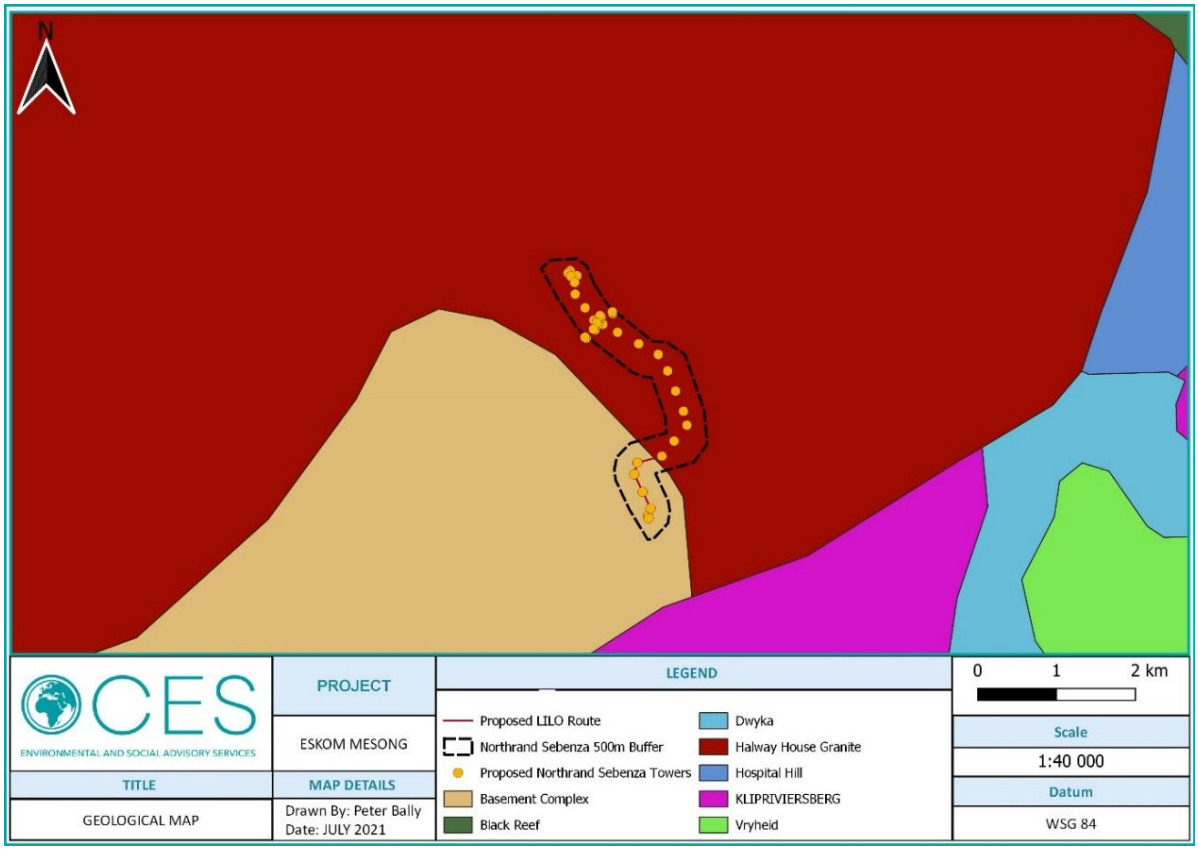


Figure 5.3: Geology map of the study site

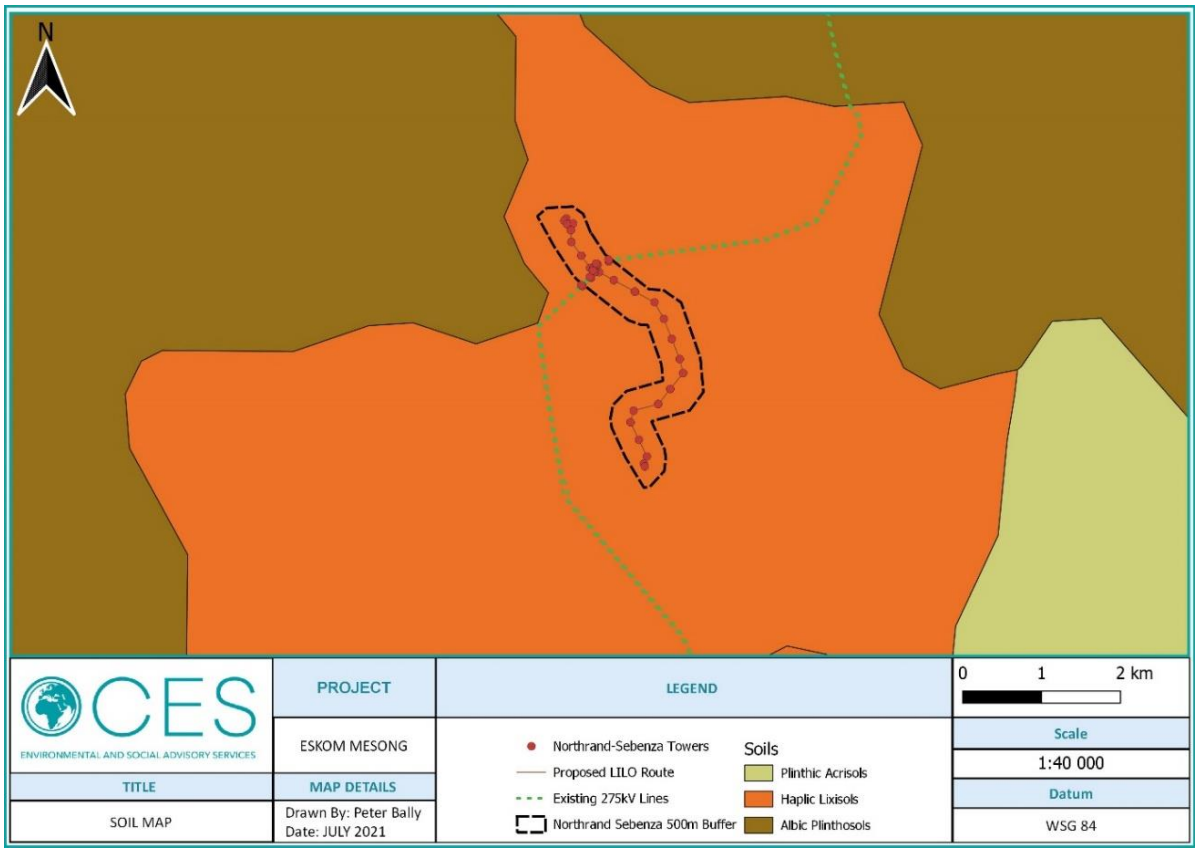


Figure 5.4: SOTER SAF Soil Map of the project area

5.1.4 LAND USE AND COVER

According to the South African National Land-Cover (2020) spatial dataset, the majority of the project area occurs within *Natural Grassland*, with the northern portion of the proposed LILO occurring within *Contiguous & Dense Planted Forest*. Portions of *Open Woodland* occur within the *Natural Grassland* portion of the project area. The proposed 400 kV LILO also passes through *Residential Formal* and *Industrial* areas (see Figure 5.5).

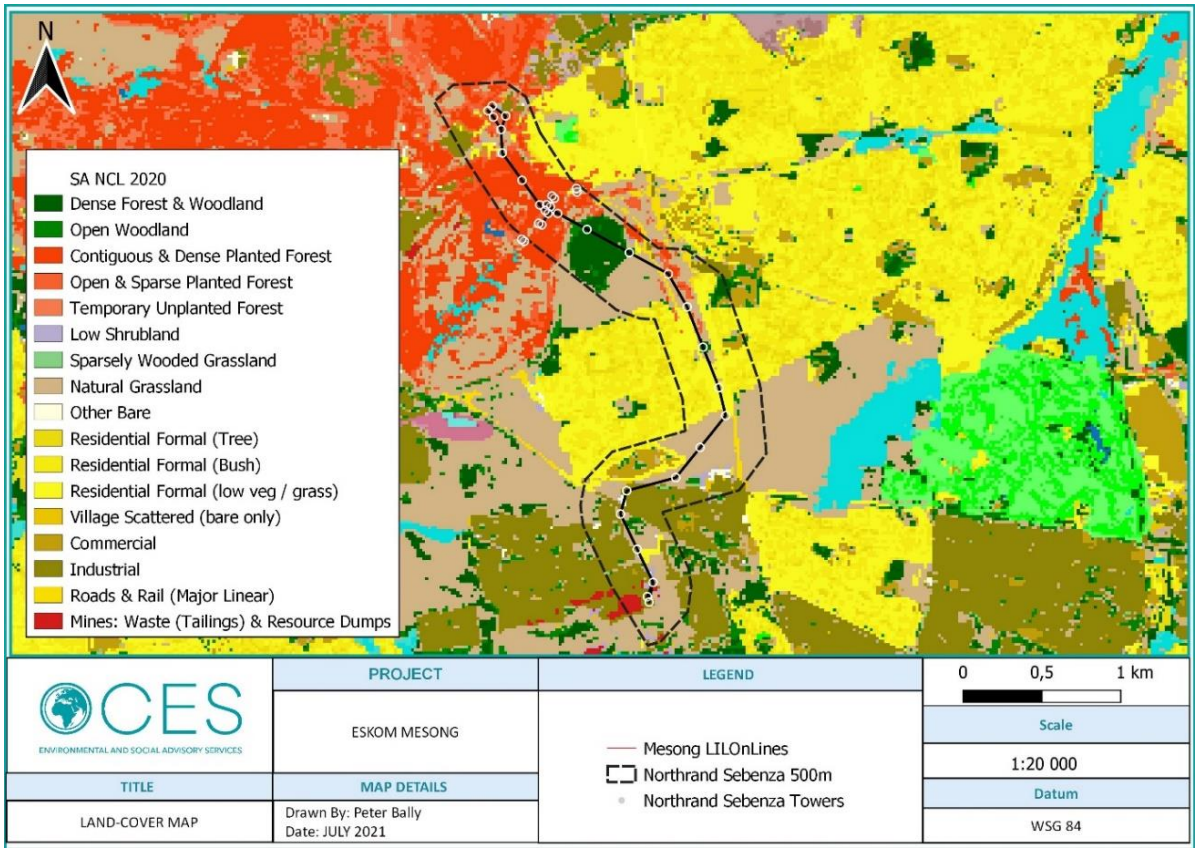


Figure 5.5: South African National Land-Cover (SANLC, 2020) Map of the project area

5.1.5 DRAINAGE, RIVER AND WETLAND ECOSYSTEM CONTEXT

The proposed development falls primarily within Quaternary Catchment A21C, which drains the Modderfontein River, a tributary of the Jukskei River, and falls entirely within the Limpopo Water Management Area (WMA) (Figure 5.6). The Modderfontein main channel flows in a north-westerly direction, falling approximately 2.3 km to the south-west of the proposed LILO line (Figure 5.6). Several non-perennial rivers and smaller drainage lines drain into the Modderfontein River, some of which intersect the proposed LILO line.

Most of the Modderfontein River has been assigned a 'Critically-Endangered' ecosystem threat status in terms of the National Biodiversity Assessment (NBA, 2018). Critically Endangered ecosystems are ecosystem types that have very little of their original extent (measured as area, length or volume) left in natural or near-natural condition. Most of the ecosystem type has been heavily, severely or critically modified from its natural state. Any further loss of natural habitat or deterioration in condition of the remaining healthy examples of these ecosystem types must be avoided, and the remaining healthy

examples should be the focus of urgent conservation action. According to the NBA (2018), the Present Ecological State (PES) of the Modderfontein from E to F ("Critically modified"), i.e. a critical change in ecosystem processes and loss of natural habitat and biota and has occurred. The Modderfontein is categorised as an Upstream Management Area in terms of the National Freshwater Ecosystem Priority Areas (NFEPA) project (2014). These are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.

Wetlands in South Africa have been mapped on a broad-scale by various stakeholders and have been included in the NFEPA (2011-2014) and NBA (2018). Due to the broad-scale nature of the NFEPA map it is not spatially accurate and, therefore, some error is expected. The location of NFEPA wetlands was derived from the National Land Cover 2000 (Van Den Berg et al., 2008) and inland water features from the Department of Land Affairs' Chief Directorate: Surveys and Mapping (DLA-CDSM). All wetlands are classified as either 'natural' or 'artificial' water bodies. The NFEPA and NBA wetland maps identify important or sensitive wetlands and wetland clusters. A wetland cluster is a group of wetlands all within 1 km of each other and which are surrounded by relatively natural vegetation. Wetland clusters allow for important ecological processes such as the migration of insects and frogs between the wetlands.

According to the National Wetland Map Version 5 (2018), no natural wetlands occur within 500 m of the proposed powerlines (Figure 5.6). Only one artificial wetland falls within 500 m of the proposed powerlines (Figure 5.6). Numerous other natural and artificial wetlands occur within the broader area. No NFEPA wetland clusters fall within 500 m of the proposed development site (Figure 5.6).

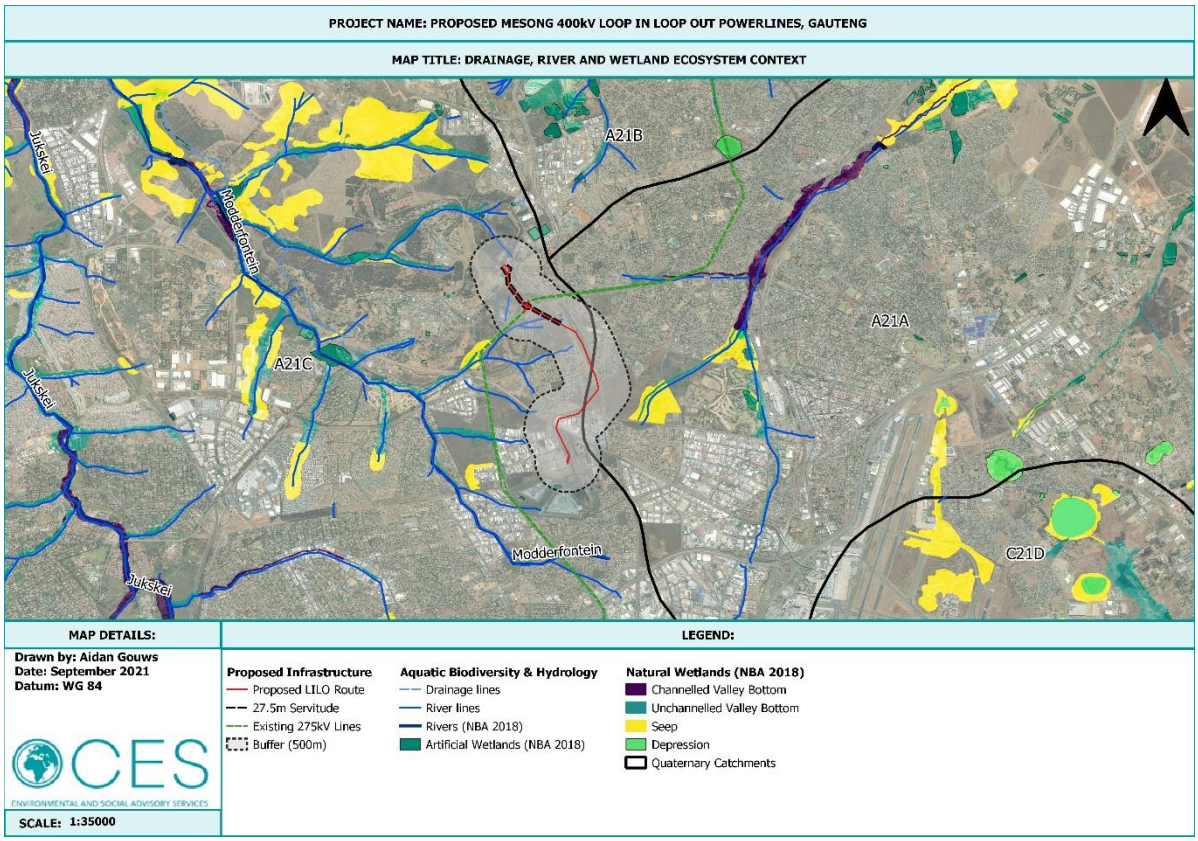


Figure 5.6: Surface water features affected by the proposed development.

5.1.6 VEGETATION AND FLORISTICS

5.1.6.1 National Vegetation Map (SA VEGMAP, 2018)

According to the SA VEGMAP (2018), the project area occurs within one (1) vegetation type – Carletonville Dolomite Grassland (Figure 5.7). This is a species-rich mosaic of plant community types occurring on undulating plains dissected by rocky chert ridges. It is a vegetation type that is characterized by the presence of the following species: *Aristida congesta, Brachiaria serrata, Cynodon dactylon, Digitaria tricholaenoides, Diheteropogon amplectens, Eragrostis chloromelas, Eragrostis racemosa, Heteropogon contortus, Loudetia simplex, Schizachyrium sanguineum, Setaria sphacelata, Themeda triandra*, and a wide variety of herbaceous forbs and other grasses. This vegetation type is considered to be Vulnerable (Driver et al., 2005 and Mucina et al., 2006), and whilst the conservation target is 24%, only a small extent is currently protected and 23% is considered to be transformed, mostly by cultivation (17%), urbanization (4%), forestry (1%) and mining (1%) (Mucina et al. 2006).

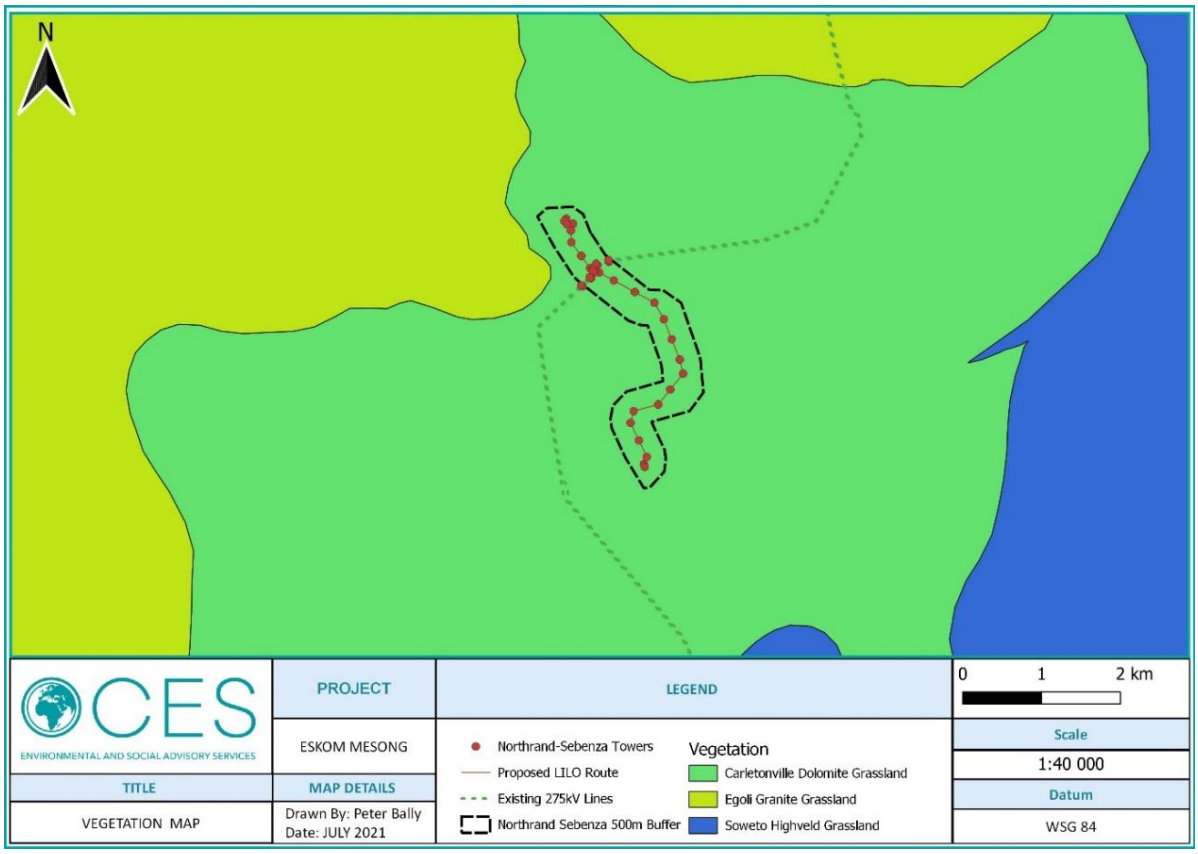


Figure 5.7: National Vegetation Map of the project site.

5.1.6.2 Critical Biodiversity Areas and broad-scale processes

The Gauteng Conservation Plan (C-Plan) is based on the systematic conservation protocols based on principles developed by Margules & Pressey (2000). This plan must be treated as a living document with periodic review and updates as the knowledge of the distribution of biodiversity, the status of species, approaches for dealing with aspects such as climate change, methods of data analysis, and the nature of threats to biodiversity within a planning region are constantly changing, especially in the Gauteng Province, which is developing at an extremely rapid rate. The main aim of the C-Plan is:

- To serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process;
- To inform protected area expansion and biodiversity stewardship programmes in the Province;
- To serve as a basis for development of Bioregional Plans in municipalities within the Province.

The Gauteng C-Plan forms part of the environmental authorization process in that if the proposed project is located within a Critical Biodiversity Area (CBA) or an Ecological Support Area (ESA), Listing Notice 3 (GN No. R. 985, as amended) activities are triggered. The Gauteng C-Plan was utilised to indicate any sensitive surrounding environments and the level of protection of these. According to the Gauteng Conservation Plan the proposed development occurs within a CBA and an Ecological Support Area (ESA) (Figure 5.8).

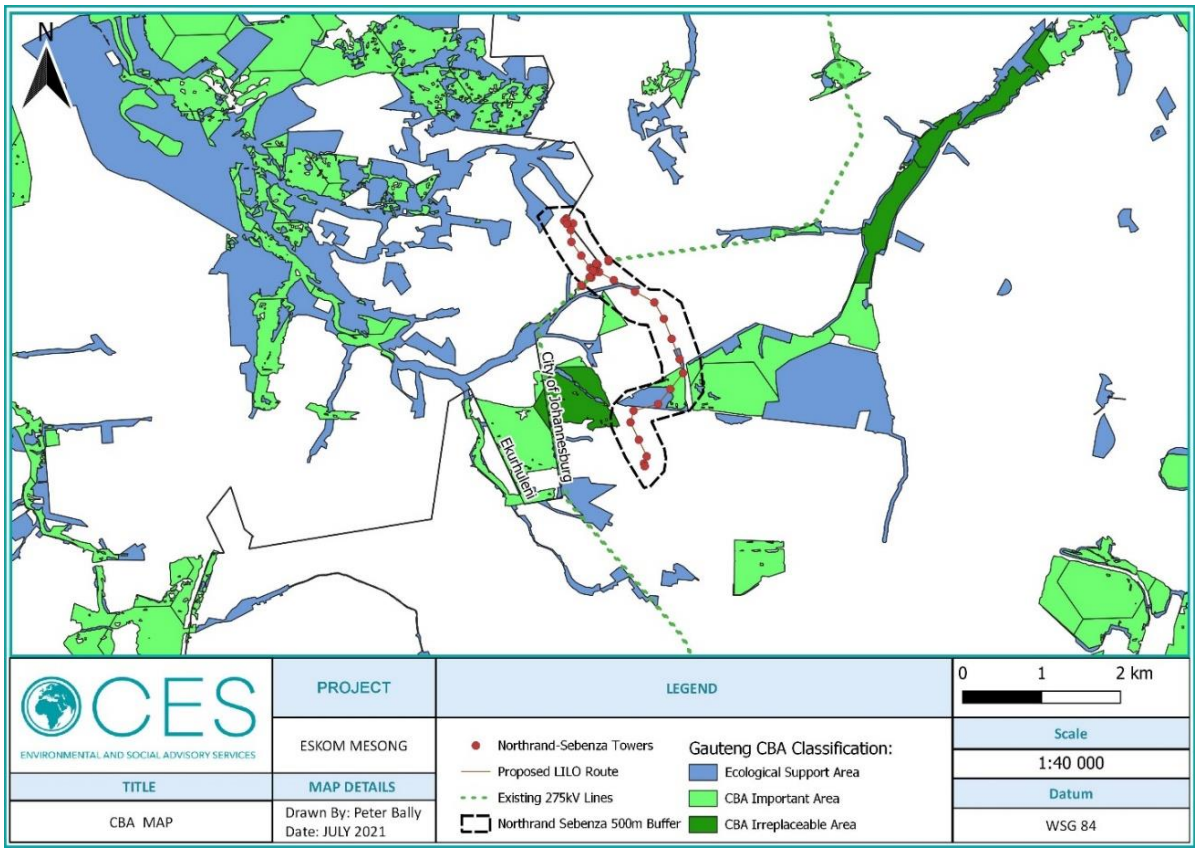


Figure 5.8: Gauteng (2011) Terrestrial CBAs within the project area

5.1.6.3 Ecosystem Threat Status

The National Environmental Management: Biodiversity Act, (Act No. 10 OF 2004) (NEM:BA) provides a National List of Ecosystems that are threatened and in need of protection – GN 1002 of 2011. According to the NEMBA List of Threatened Ecosystems, the project does not occur within or near to a threatened ecosystem. These findings are supported by the NBA (2018) *Terrestrial ecosystem threat status assessment* (Skowno *et al*., 2019) which confirmed that the ecosystems within and surrounding the project area are classified as Least Concern.

5.1.6.4 Gauteng Ridge Guidelines

A section of the project area falls within a Class 3 Ridge (Figure 5-9). As per the Gauteng Ridge Guidelines, "Class 3 ridges include ridges of which 35% or more, but less than 65%, of their surface area has been converted to urban development, quarries and/or alien vegetation. Approximately 9% of ridges currently fall within Class 3, including the ridge that traverses the Northcliff, Roodepoort and Krugersdorp areas". The following guidelines apply to Class 3 Ridges:

- *The consolidation of properties on Class 3 ridges is supported.*
- *The guidelines for Class 2 ridges will be applied to areas of the ridge that have not been significantly impacted on by human activity, i.e.:*
    - *The consolidation of properties on Class 2 ridges is supported;*
    - *The subdivision of property on Class 2 ridges will not be permitted;*
    - *Development activities and uses that have a high environmental impact on a Class 2 ridge will not be permitted;*
    - *Low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the property may be permitted. (The ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision); and*
    - *Low impact development activities on a ridge will not be supported where it is feasible to undertake the development on a portion of the property abutting the ridge.*
- *The guidelines for Class 4 ridges will be applied to areas of the ridge that have been significantly impacted on by human activity, i.e.:*
    - *The consolidation of properties on Class 4 ridges is supported;*
    - *The subdivision of property on Class 4 ridges will not be permitted in areas of the ridge where the remaining contiguous extent of natural habitat is 4 ha or more; and*
    - *Further development activities will not be permitted in areas of the ridge where the remaining contiguous extent of natural habitat is 4 ha or more.*

5.1.6.5 Protected and Priority Areas

The National Protected Areas Expansion Strategy (NPAES, 2008) was developed to "achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change." The NPAES originated as Government recognised the importance of protected areas in maintaining biodiversity and critical ecological process. The NPAES sets targets for expanding South Africa's protected area network, placing emphasis on those ecosystems that are least protected. The site is not located within a protected area identified by SAPAD (2020) or a NPAES Focus Area. The nearest protected area is Glen Austin approximately 11 km north of the proposed development (Figure 5.10).

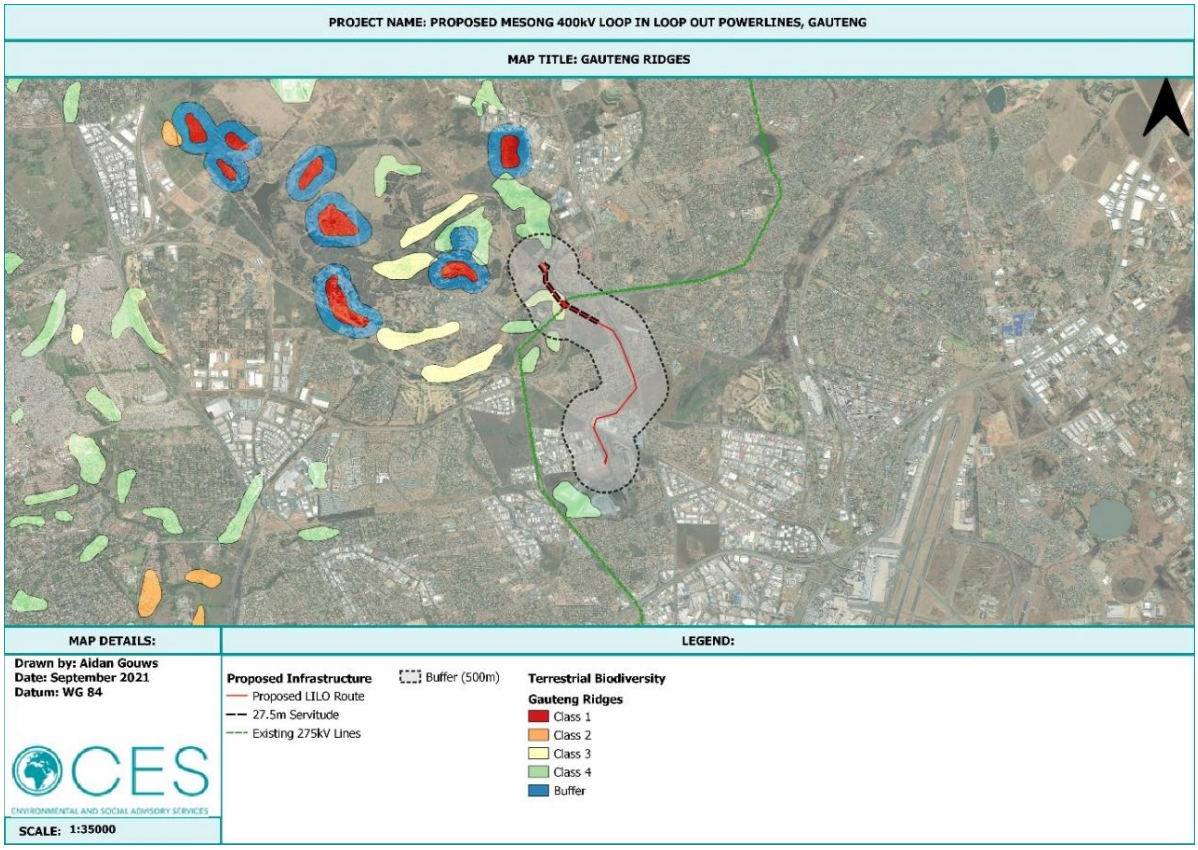


Figure 5-9: Gauteng Ridge Classification map of the project area

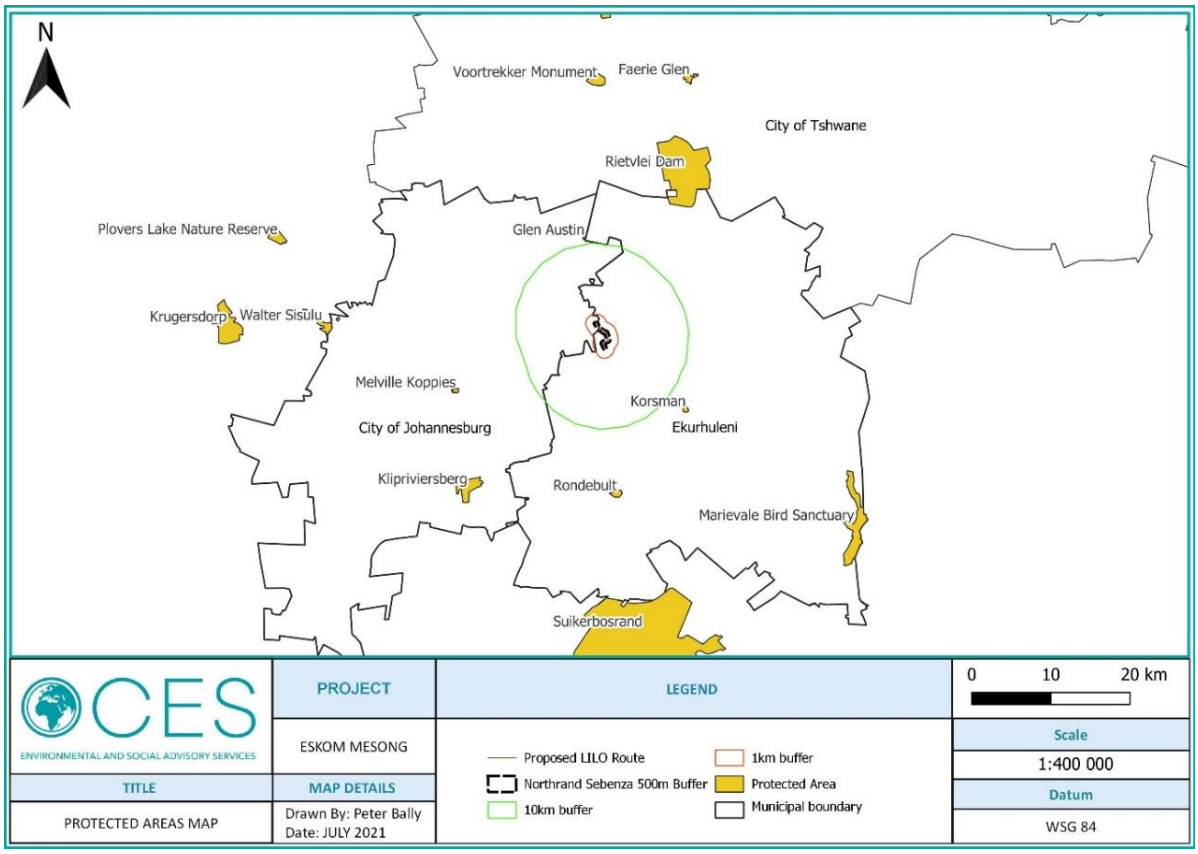


Figure 5.10: NPAES Focus Areas and Protected Areas.

5.1.7 FAUNA

South Africa is a faunally diverse country, with approximately 1,663 terrestrial vertebrate faunal species of which 850 species are birds, 343 species are mammals, 350 species are reptiles, and 120 species are amphibians spread across seven biomes and 122 million km². The Gauteng Province is home to approximately over 30 amphibian species, 100 reptile species and 200 mammal species (ADU, 2021; IUCN, 2021)..

5.1.7.1 Amphibians

Of the more than 30 amphibian species in Gauteng Province, 24 species have a distribution range which includes the proposed development site (ADU, 2021; iNaturalist, 2021; IUCN, 2021). Thirteen of these species have been recorded within a 30 km radius of the site (ADU, 2021). All amphibian species likely to occur on site are listed as of Least Concern. A full list of amphibian species with a distribution range which includes the development area is provided in the Terrestrial Biodiversity Report.

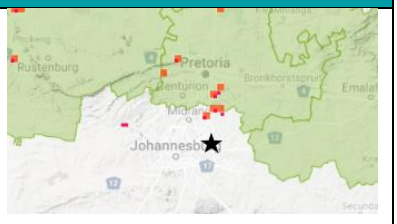
5.1.7.2 Reptiles

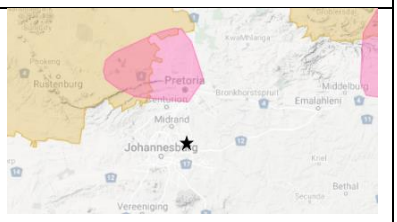
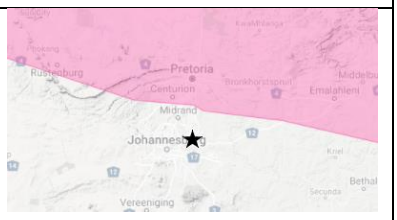
The Gauteng Province is home to over 100 reptile species (ADU, 2021), 92 of which have a distribution which includes the proposed development site (ADU, 2021; iNaturalist, 2021; IUCN, 2021). Approximately 50 reptile species have been recorded within a 30 km radius of the site (ADU, 2021). All reptile species likely to occur on site are listed as of least concern. A full list of reptile species with a distribution range which includes the development area is provided in Terrestrial Biodiversity Report.

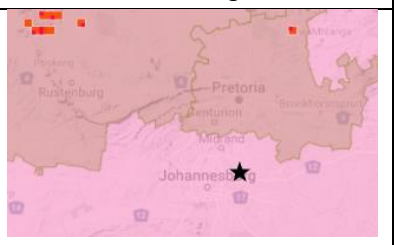
5.1.7.3 Mammals

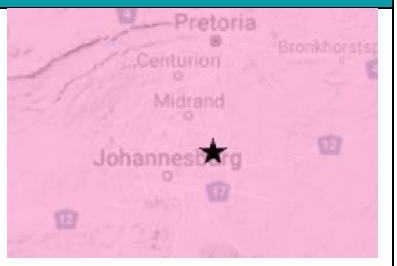
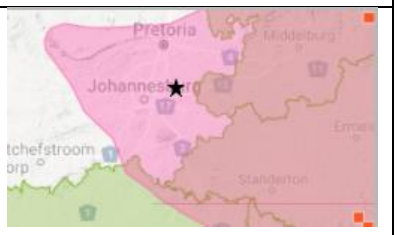
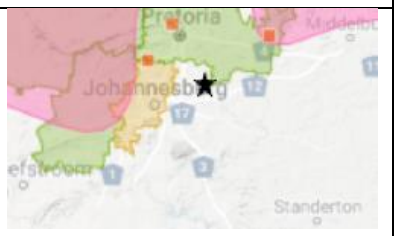
Of the 200+ mammal species which occur in the Gauteng Province, 138 have a distribution which includes the proposed development site (ADU, 2021; iNaturalist, 2021; IUCN, 2021) and approximately 65 of these have been recorded within a 30 km radius of the site (ADU, 2021). Ten of the 138 species with distribution ranges which include the site are considered SCCs, including one critically-endangered, three endangered and six vulnerable species (Table 5-1). A full list of mammal species with a distribution range which includes the development area is provided in the Terrestrial Biodiversity Report.

Table 5-1: Mammalian SCC distributional ranges (pink area) and observations (orange squares – iNaturalist 2021, pink squares – GBIF 2021) in relation to the project area (black star).

SPECIES	THREAT STATUS	HABITAT	DISTRIBUTION / OBSERVATIONS
Acinonyx jubatus (Cheetah)	VU	Cheetahs are found in a wide range of habitats and ecoregions, ranging from dry forest and thick scrub through to grassland and hyper-arid deserts. They are only absent from tropical and montane forest. Cheetah appear to show relatively low habitat selectivity compared with other carnivores	 Cheetah are typically limited to fenced-off reserves. Additionally, the site falls adjacent to current

SPECIES	THREAT STATUS	HABITAT	DISTRIBUTION / OBSERVATIONS
		(Durant, Mitchell, Ipavec, & Groom, 2015).	and historical land use activities and lacks sufficient prey to support large carnivores, such as the Cheetah. The likelihood of the species occurring on site is considered **low**.
Chrysospalax villosus (Rough-haired Golden Mole)	VU	The Rough-haired Golden Mole is found on sandy soils in grasslands, meadows and along edges of marshes in Savanna and Grassland biomes of South Africa. It has also been found in gardens, parklands, dense stands of kikuyu grass and marginally on golf courses adjoining natural grasslands (Bronner, 2015).	 The Rough-haired Golden Mole's range occurs further to the north around Pretoria. However, portions of the site, namely CDG vegetation, provide suitable habitat for this species. The likelihood of the species occurring on site is considered **moderate** within in CDG vegetation.
Cloeotis percivali (Percival's Short-eared Trident Bat)	EN	Percival's Trident Bat occurs in savanna areas where there is sufficient cover in the form of caves and mine tunnels for day roosting. It feeds exclusively on moths, and appears to be very sensitive to disturbance (Monadjem, et al., 2017).	 Percival's Trident Bats' distribution range generally falls north of Midrand. Despite the lack of suitable habitats on site with sufficient cover for roosting (such as caves and mine tunnels), the site is possibly used as a feeding ground. The likelihood of the species occurring within the project area is therefore **moderate** in CDG vegetation.
Crocidura maquassiensis (Makwassie musk shrew)	VU	The Makwassie musk shrew is generally found in rocky, mountain habitats, but may tolerate a wider range of habitats, with some individuals found in gardens and mixed bracken/grassland riversides in KwaZulu-Natal (Cassola, 2016).	 The Makwassie musk shrew's distribution range includes the site and portions of the site, namely CDG vegetation, may

SPECIES	THREAT STATUS	HABITAT	DISTRIBUTION / OBSERVATIONS
			provide suitable habitat for this species. The likelihood of the species occurring within the project area is therefore **moderate** in CDG vegetation.
Diceros bicornis (Black Rhino)	CR	The Black Rhino occurs in a wide variety of habitats from desert areas in Namibia to wetter wooded areas. The highest densities of rhinos are found in savannas on nutrient-rich soils and in succulent Valley Bushveld areas. Black Rhino are browsers and favour small acacia's and other palatable woody species (Grewia's, Euphorbiaceae species, etc.) as well as palatable herbs and succulents. Apart from plant species composition and size structure, Black Rhino carrying capacity is related to rainfall, soil nutrient status, fire histories, levels of grass interference, extent of frost and densities of other large browsers (Emslie, 2020).	 Due to its critically endangered status, the Black Rhino is primarily confined to fenced-off reserves in South Africa. The likelihood of the species occurring within the project area is therefore **low**.
Felis nigripes (Black-footed Cat)	VU	The Black-footed Cat can be found in dry savannas, subtropical grasslands and the Karoo semi-desert with sparse shrub and tree cover. Predominantly ground-dwellers and during the day use dens in termite mounds or made by other animals (Sliwa, Wilson, Küsters,, & Tordiffe, 2016).	 The Black-footed Cat's distribution range includes the site and portions of the site, namely semi-natural CDG vegetation, may provide suitable habitat for this species. The likelihood of the species occurring within the project area is therefore **moderate** in CDG vegetation. It is recommended that a search and rescue team be sent ahead of vegetation clearance and construction teams to ensure that no individuals are found on site. This team should focus on checking termite mounds, burrows and dens in particular.

SPECIES	THREAT STATUS	HABITAT	DISTRIBUTION / OBSERVATIONS
Mystromys albicaudatus (White-tailed rat)	VU	The White-tailed rat is thought to occur within Carletonville Dolomite Grasslands, on sloped clay soils and are often associated with calcrete soils within grasslands. They are never found on soft, sandy substrate, rocks, wetlands or riverbanks (Avenant, et al., 2019).	 The White-tailed rat's distributional range includes the site and the species displays a preference for CDG vegetation. The likelihood of the species occurring within the project area is therefore **moderate** in CDG vegetation. It is recommended that a search and rescue team be sent ahead of vegetation clearance and construction teams to ensure that no individuals are found on site.
Ourebia ourebi and *Ourebia ourebi ourebi* (Oribi)	EN	Oribi inhabit savanna woodlands, floodplains and other open grasslands, reaching their highest density on floodplains and moist tropical grasslands, especially in association with large grazers (IUCN SSC Antelope Specialist Group, 2016).	 The Oribi's distributional range includes the site. However, there is insuffient intact habitat available to support the species on site. The likelihood of the species occurring within the project area is therefore **low**.
Panthera pardus (Leopard)	VU	Leopards have a wide habitat tolerance and highly varied diet. Their habitats include woodland, grassland savanna and mountain habitats but they also occur widely in coastal scrub, shrubland and semi-desert (Swanepoel, et al., 2016).	 The site falls adjacent to current and historical land use activities and lacks sufficient prey to support large carnivores, such as the Leopard. The likelihood of the species occurring within the project area is therefore **low**.

5.2 SOCIO-ECONOMIC PROFILE

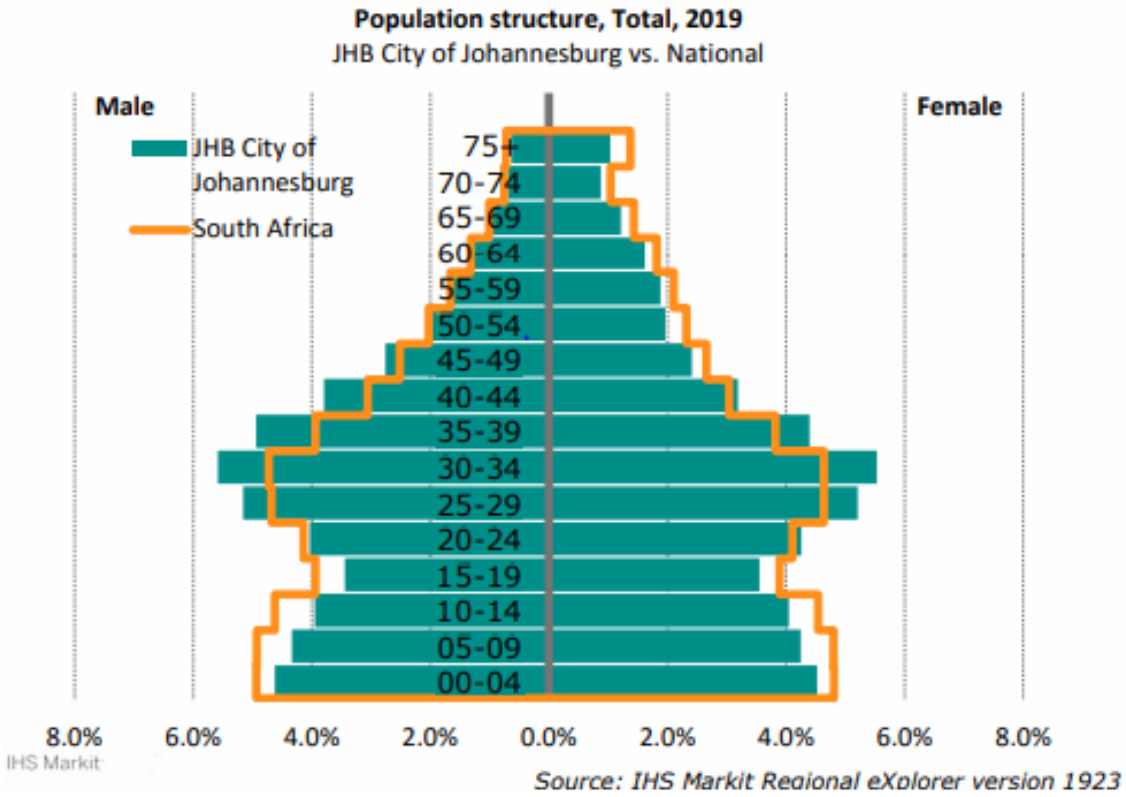
The proposed loop-in loop out transmission line is located between Johannesburg and Ekurhuleni Metropolitan Municipality. The municipalities are classified as Category A situated within Gauteng.

5.2.1 POPULATION

5.2.1.1 Johannesburg District Municipality

South Africa's population is close to 60 million. Gauteng is the most populous province in the country with Johannesburg contributing an estimated 5.74 million people to the total population of the province (15.18 million). In the past decade, population growth in the city averaged 2.91% per annum which is close to double the growth rate of South Africa as a whole (1.57%). Overtime, the province has shown the greatest increase in population numbers relative to the other eight (8) provinces, largely due to both interprovincial and international migration.

The city's population is at 5.74 million up, from 4.4 million in 2011 - an increase by (20%) in the last nine years. In a given month, total population increase that includes both migration and net fertility in the last five years has been 8 575. Given the migration rate of approximately 35.3%, this points toward about 3 027 migrants entering into the city every month.
The number of households in the city has increased by an average annual rate of 3% from 2007 to 2017.



The population pyramid reflects a projected change in the structure of the population from 2019 and 2023. The differences can be explained as follows:

- In 2019, there is a significantly larger share of young working age people between 20 and 34 (29.2%), compared to what is estimated in 2023 (25.6%). This age category of young working age population will decrease over time.
- The fertility rate in 2023 is estimated to be slightly higher compared to that experienced in 2018.
- • The share of children between the ages of 0 to 14 years is projected to be significant smaller (24.0%) in 2023 when compared to 2018 (25.0%).

5.2.1.2 Ekurhuleni District Municipality

With 3.38 million people, Ekurhuleni housed 6.2% of South Africa's total population in 2015. Between 2005 and 2015 the population growth averaged 2.39% per annum which is close to double than the growth rate of South Africa as a whole (1.51%). Compared to Gauteng's average annual growth rate (2.67%), the growth rate in Ekurhuleni's population at 2.39% was very similar to that of the province.

The City's population has grown exponentially since its establishment in the year 2000. The population has nearly doubled in the last seventeen years from an estimated 2 368 283 in the year 2000 to 3379104 in 2016. The City's population growth rate is steady at 2.47% per annum, coming down from a high of 4% per annum in the period between 1996 and 2001.

The current population represents over 6% of the total population of South Africa (StatsSA: 2017). An important feature of growth in the Ekurhuleni population is the net migration into the city. Ekurhuleni, together with Tshwane and Johannesburg are the largest recipients of in-migration in the country. The city has a median age of 30 and 66% of the population is between the ages of 18-64, 18% is below the age of 18 and 6% is above the age of 65. The city has a relatively young population which is about the same rate as that of Gauteng Province.

The African (black) population accounts for 80% of the population followed by the white population at 14%, the Coloured population at 3% and the Indian population at 2%. Males make up 51% of the population within the city and females account for 49%. Isizulu is the most widely spoken language at home at about 34% followed by Sepedi at 12%, Sesotho at 11% and English at 10%. Generally, the population of the city speak more than 1 official South African language and all 11 languages are spoken within the city.

5.2.2 ECONOMY

5.2.2.1 Johannesburg District Municipality

Despite increased growth over the last ten years, and Johannesburg's status as an engine of the national economy contributing to 16% of South Africa's GDP, the Johannesburg economy remains one of the unequal city economies in the world. Formal employment opportunities have not kept pace with GDP growth; only 12% of formal employment opportunities were located in the metro. Combined with low formal job growth, the low level of education in the City and low skills base is incompatible with the current economic structure of the City weighted towards high end financial services that require highly skilled persons. 40% of Johannesburg's formally employed are unskilled or semi-skilled, 45% are classified as skilled and only 14% of the total working population are highly skilled. The skills deficit in Johannesburg remains a critical challenge.

5.2.2.2 Ekurhuleni District Municipality

With a GDP of R 301 billion in 2015 (up from R 128 billion in 2005), Ekurhuleni contributed 21.43% to the Gauteng Province GDP of R 1.41 trillion in 2015 increasing in the share of the Gauteng from 22.18% in 2005. The City of Ekurhuleni contributes 7.51% to the GDP of South Africa which had a total GDP of R 4.01 trillion in 2015 (as measured in nominal or current prices). It's contribution to the national economy remain constant in importance from 2005 when it contributed 7.5% to South Africa, but it is lower than the peak of 7.8% in 2005. The declining percentage contribution of Ekurhuleni to the national GDP is consistent with the decline in manufacturing that was highlighted above.

5.2.3 EMPLOYMENT, EDUCATION, INCOME AND POVERTY

5.2.3.1 Johannesburg District Municipality

In 2019, the unemployment rate in City of Johannesburg Metropolitan Municipality (based on the official definition of unemployment) was 26.5%, which is an increase of 3.19 percentage points. The unemployment rate in City of Johannesburg Metropolitan Municipality is lower than that of Gauteng. The unemployment rate for South Africa was 27.18% in 2018, which is an increase of - 3.59 percentage points from 23.60% in 2008.

The finance sector is the biggest employer in the region accounting for 26.6% of total employment, followed by the trade sector which employs 21.1% of the formal sector workers. The agricultural sector employs the least share of the formal sector workers with only 0.4% (Global Insight, 2015). The informal sector employs 12.4% of the total employment in Johannesburg. The biggest number of informal economy jobs is generated in trade.

Youth unemployment is a critical challenge facing the country at large, and the City of Johannesburg is no exception. Slow formal sector growth is the major causes of youth unemployment. The majority of youth due to unemployability and their low skills are employed in the wholesale, retail & trade and private households, which accounts for 16%. Only 5% are employed in the highly skilled manufacturing sector, thus pointing to a need for education and skills development targeting this youth to improve their employability.

In Johannesburg, the vast majority of the youthful population only has a matric certificate, a situation which makes them often undesirable in the evolving job market, and this category of the youth cannot access the labour market because they are categorised as semi unemployable in the tertiary sector based economy like that of Johannesburg. The labour market is not creating enough jobs due to low economic growth as influenced by the dwindling investor confidence coupled with possible high cost of doing business, and the supply of educated skilled professionals is lagging when considering sector-specific skills.

The quality of education in many public schools is inadequate or perceived as substandard, while private education is unavailable to the vast majority of Johannesburg learners due to the prevailing meritocracy and socio-economic inequality.

The poor foundation skills provided by many public schools, in respect of maths and science, further debilitate learners when entering university. And thus, vast majority of learners from these schools face academic exclusion on their first year of study.

5.2.3.2 Ekurhuleni District Municipality

Within the City of Ekurhuleni, the number of people without any schooling decreased from 2005 to 2015 with an average annual rate of -4.83%, while the number of people within the 'matric only' category, increased from 538,000 to 818,000. The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 4.82%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 6.33%. Overall improvement in the level of education is visible with an increase in the number of people with 'matric' or higher education.

In 2015, Ekurhuleni employed 1.19 million people which is 23.92% of the total employment in Gauteng (4.96 million), 7.71% of total employment in South Africa (15.4 million). Employment within Ekurhuleni increased annually at an average rate of 2.54% from 2005 to 2015. The City of Ekurhuleni's average annual employment growth rate of 2.54% exceeds the average annual labour force growth rate of 2.33%.

In Ekurhuleni the economic sectors that recorded the largest number of employment in 2015 were the finance sector with a total of 261 000 employed people or 22.0% of total employment in the City. The trade sector with a total of 259 000 (21.8%) employs the second highest number of people relative to the rest of the sectors. The mining sector with 7 190 (0.6%) is the sector that employs the least number of people in Ekurhuleni, followed by the electricity sector with 8 160 (0.7%) people employed.

The number of formally employed people in the City of Ekurhuleni counted 1.03 million in 2015, which is about 86.71% of total employment, while the number of people employed in the informal sector counted 158 000 or 13.29% of the total employment. Informal employment in Ekurhuleni increased from 128 000 in 2005 to an estimated 158 000 in 2015.

In 2015, the unemployment rate in Ekurhuleni (based on the official definition of unemployment) was 29.72%, which is an increase of 0.868 percentage points. The unemployment rate in Ekurhuleni is higher than that of Gauteng as can be seen in the figure below. The unemployment rate for South Africa was 25.28% in 2015, which is a decrease of 1.27 percentage points from 26.55% in 2005.

6 PUBLIC PARTICIPATION PROCESS

Public consultation is a legal requirement throughout the Basic Assessment (BA) *process*. Developers are required to conduct public consultation throughout the BA process. Formal BA documents are required to be made available for public review, which include the project brief, Draft Basic Assessment Report (BAR), Draft Environmental Management Programme (EMPr), and the decision of the Competent Authority.

According to Regulation 41(2) of the NEMA EIA Regulations 2014 (as amended 2017) "*The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act",* including:

- The 2012 Public Participation Guidelines (General Notice 807 of 2012), which provides information and guidance for applicants, I&APs and EAPS on the public participation requirements of the BA process; and
- The Promotion of Access to Information Act (PAIA), 2000 (Act No. 2 of 2000), which allows citizens access to any information held by the State, and any information held by private bodies that is required for the exercise and protection of any rights.

"and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by'':

6.1 SITE NOTICES

(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—
(i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and
(ii) any alternative site.

A site notice was placed at the entrance to the Modderfontein (26°05'13.3"S, 28°10'48.7"E) during the initial site visit on 20 August 2021.

6.2 I&AP AND STAKEHOLDER NOTIFICATIONS

(b) giving written notice, in any of the manners provided for in section 47 D of the Act, to—
(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, and to any alternative site where the activity is to be undertaken;
(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
(iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
(iv) the municipality which has jurisdiction in the area;
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and
(vi) any other party as required by the competent authority;

Formal notifications will be sent out via email and postal mail to notify potential Interested and Affected Parties (I&APs) of the inception of the proposed development and invite them to register to be added to the I&APs database and provide initial comments. All registered I&APs will be notified via email and postal mail of the availability of the Draft BAR and EMPr for public review. All notification proofs will be provided in the final reports.

6.3 NEWSPAPER ADVERTISEMENT

> *(c) placing an advertisement in—*
> *(i) one local newspaper; or*
> *(ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
> *(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);*

A newspaper advertisement will be placed in the Ekurhuleni News, in order to notify the general public of the proposed development and availability of the Draft BAR for public review. All publication proofs will be provided in the final reports.

6.4 REGISTER OF STAKEHOLDERS AND I&APS

According to Regulation 42 of the NEMA EIA Regulations 2014 (as amended 2017) "*A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—*

> *(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
> *(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
> *(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.*

A comprehensive I&AP register will be compiled and will be included in the final reports. This register will include the following parties, among others:

- Immediate neighbours,
- The National Department of Forestry, Fisheries and Environment (DFFE);
- The Department of Mineral Resources and Energy (DMRE);
- The Department of Human Settlement, Water and Sanitation (DHSWS);
- The Gauteng Department of Agriculture and Rural Development (GDARD);
- The Gauteng Department of Roads and Transport (GPDRT);
- The Provincial Heritage Resources Authority Gauteng (PHRAG); and

- The Johannesburg and Ekurhuleni Metropolitan Municipalities, including the Municipal Ward councillors.

6.5 PUBLIC REVIEW OF DRAFT BASIC ASSESSMENT REPORT

The Draft BAR and EMPr will be subject to a 30-day public review period. The draft reports will be made available electronically on the CES website. Letters of notification will be emailed and/or posted to the registered I&APs, notifying them of the commencement of the public review period and the availability of the draft reports (including the link to the CES website), as well as providing the contact details (telephone and email) of the EAP. I&APs will be invited to provide comment on the draft reports via a number of contact options, namely telephone, post, fax and/or email. Additionally, I&APs will be provided the option of receiving a hardcopy version of the executive summary of the draft reports via registered post, upon request, in cases where they are unable to access the electronic version. The medium of correspondence will be noted in the I&APs register.

6.6 PUBLIC MEETING

It is not compulsory to hold a public meeting in terms of the NEMA EIA Regulations 2014 (as amended 2017). However, should sufficient interest or concern be raised by the public through the public participation process, a VIRTUAL public meeting may be considered. Meetings will be conducted virtually via Microsoft Teams (or alternative), if required. Telephonic meetings will be conducted for I&APs with limited or no internet connectivity, if required.

6.7 ISSUES RAISED BY I&APS

> *The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans, and that such written comments, including responses, are attached to the reports and plans that are submitted to the competent authority in terms of these regulations."*

A full record of the issues raised by the I&APs, as well as the response by the applicant and EAP, will be kept throughout the duration of the project. A full Issues and Response Trail (IRT) will be attached to the final reports.

7 ALTERNATIVES

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

"**Alternatives**", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) The property on which or location where it is proposed to undertake the activity.
(b) The type of activity to be undertaken.
(c) The design or layout of the activity.
(d) The technology to be used in the activity.
(e) The operational aspects of the activity.
(f) The option of not implementing the activity.

7.1 FUNDAMENTAL, INCREMENTAL AND NO-GO ALTERNATIVES

7.1.1 FUNDAMENTAL ALTERNATIVES

Fundamental alternatives are developments that are totally different from the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity.
- Alternative type of activity to be undertaken.
- Alternative technology to be used in the activity.

7.1.2 INCREMENTAL ALTERNATIVES

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered with respect to the current project, including:

- Alternative design or layout of the activity.
- Alternative operational aspects of the activity.

7.1.3 NO-GO ALTERNATIVE

It is mandatory to consider the "no-go" option in the BA process. The "no-go" alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The no-go is the continuation of the existing land use, i.e. maintain the status quo.

7.2 ALTERNATIVES CONSIDERED

Integral to the EIA process is the consideration and evaluation of alternatives to the proposed development plan. For the purposes of this Basic Assessment, the following alternatives have been assessed

7.2.1 LOCATION AND LAYOUT ALTERNATIVES

TYPE OF ALTERNATIVES CONSIDERED	DESCRIPTION OF THE ALTERNATIVE RELATING TO THE PROPOSED LILO POWERLINE
Location alternative	Only one location (corridor), with one layout has been assessed (Figure 2.1). The proposed route for the LILO is the most direct and avoids having to navigate through the surrounding urban areas. Therefore, only the project corridor and layout as described in this report has been considered.

7.2.2 TECHNOLOGY ALTERNATIVES

TYPE OF ALTERNATIVES CONSIDERED	DESCRIPTION OF THE ALTERNATIVE RELATING TO THE PROPOSED OHL
Technology alternatives	Only the development of a 400 kV LILO strung on steel lattice pylon structures is considered.

7.2.3 ACTIVITY ALTERNATIVES

TYPE OF ALTERNATIVES CONSIDERED	DESCRIPTION OF THE ALTERNATIVE RELATING TO THE PROPOSED OHL
Activity alternatives	The project involves the development of 2 x 1 km 400 kV line- loop-in and loop-out (LILO) powerlines. Alternative activities for the current project are not reasonable or feasible as the purpose of the proposed LILO is to connect the existing Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS).

7.2.4 NO-GO ALTERNATIVE

TYPE OF ALTERNATIVES CONSIDERED	DESCRIPTION OF THE ALTERNATIVE RELATING TO THE PROPOSED OHL
No-go alternative	The “No-go” alternative entails maintaining the status quo. In other words, the proposed construction of the 400 kV LILO would not go ahead, and current land uses would continue as before. While potential risks associated with the new 400 kV LILO would be avoided, the existing impacts of existing electrical infrastructure (i.e. existing powerline and switching station) would persist and, potential benefits of the proposed project would be forfeited.

Table 7.1: Analysis of the proposed alternatives for the 400 kV Mesong LILO powerline.

LEVEL	ALTERNATIVES	ADVANTAGES	DISADVANTAGES	REASONABLE AND FEASIBLE	FURTHER ASSESSMENT
Property or location	Preferred location and layout – Farms Zuurfontein 33 IR, Klipfontein 12 IR and Modderfontein 34 IR (Figure 2.1)	• Similar to the existing infrastructure. • Site already degraded / transformed.	• Proposed LILO falls across a wetland.	YES	YES
Technology	Preferred technology – 400 kV LILO strung on steel lattice pylon structures	• Similar to the existing infrastructure. • Relatively simple design with easy installation.	• Larger footprint than monopole structure.	YES	YES
Activity	Alternative activities for the current project are not reasonable or feasible as the purpose of the proposed LILO is to connect the existing Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS).			YES	NO
No-go option	The "No-go" alternative entails maintaining the status quo. In other words, the proposed construction of the 400 kV OHL would not go ahead, and current land uses would continue as before.	• No additional impact to the existing natural and social environment.	• No benefit of upgraded electrical infrastructure	YES	YES

8 SUMMARY OF SPECIALIST KEY FINDINGS

Appropriately qualified and experienced specialists are appointed to undertake screening assessments. The specialists will gather baseline information relevant to the study and impacts associated with the proposed development. The specialists will also make recommendations to mitigate negative impacts and enhance benefits.

ASSESSMENT	SPECIALIST	AFFILIATION
Agricultural	Johan Lanz	Independent
Archaeological	Neels Kruger	Exigo Sustainability(Pty) Ltd
River and Wetland	Aidan Gouws	CES (Pty) Ltd
	Ryan Edwards	Verdant Environmental (Pty) Ltd
Terrestrial Ecology	Aidan Gouws & Alan Carter	CES (Pty) Ltd

8.1 AGRICULTURAL COMPLIANCE STATEMENT

8.1.1 TERMS OF REFERENCE

The Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources, gazetted on 20 March 2020, states that:
"Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, must be confirmed by undertaking a site sensitivity verification that confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool."

In terms of the gazetted agricultural protocol, a site sensitivity verification must be submitted that:

- Confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status, etc.; and
- Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

8.1.2 KEY FINDINGS

The proposed site is identified on the national web based environmental screening tool as being of high and medium sensitivity for agricultural resources. This is because the site's land capability evaluation values, of 7 to 9 classify it within the medium (7-8) and high (9) sensitivity classes.

The agricultural sensitivity, as identified by the screening tool, is disputed by this assessment. The motivation for disputing the sensitivity is that the screening tool does not take zoning or any urban land use or designation into account when classifying agricultural sensitivity. Even land occupied by buildings, in the middle of a city, can still be classified as high agricultural sensitivity by the screening tool, which obviously makes no sense. In reality, such land has zero potential for agricultural production and therefore for being high agricultural sensitivity.

Likewise, the classification of high agricultural sensitivity in this case does not take account of the fact that the site is within the urban area of Johannesburg, and although it has no buildings on it, could not possibly and practically be used for agricultural production. Its location negates any agricultural production potential. The site cannot, therefore, be considered to be of anything but low agricultural sensitivity, in terms of the available sensitivity categories, which are: low; medium; high; and very high. The designation of high agricultural sensitivity by the screening tool is therefore invalid, because the screening tool does not take any urban land use or designation into account when classifying agricultural sensitivity.

It is hereby confirmed that the entire site is of low sensitivity for agriculture, because its location prevents any agricultural production potential. Furthermore, it is confirmed that, because the location already prevents current or future agricultural use of the land anyway, the proposed development cannot have an unacceptable negative impact on the agricultural production capability of the site.

8.2 ARCHAEOLOGICAL IMPACT ASSESSMENT

8.2.1 TERMS OF REFERENCE

Heritage specialist input into the Basic Assessment (BA) process is essential to ensure that, through the management of change, developments still conserve our heritage resources. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of heritage resources. The heritage component of the EIA is provided for in the National Environmental Management Act, (Act 107 of 1998) and endorsed by section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999). In addition, the NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources. Based hereon, this project functioned according to the following terms of reference for heritage specialist input:

- Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may be affected, if any.
- Assess the nature and degree of significance of such resources within the area.
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess and rate any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.
- Propose possible heritage management measures provided that such action is necessitated by the development.
- Liaise and consult with the South African Heritage Resources Agency (SAHRA). A Notification of Intent to Develop (NID) will be submitted to SAHRA at the soonest opportunity.

8.2.2 KEY FINDINGS

A number of academic archaeological and historical studies have been conducted in this section of the Gauteng Province and these studies all infer a relatively rich and diverse archaeological landscape, representative of most phases of human and cultural development in Southern Africa. Contained in

its archaeology are traces of conquests by Bantu-speakers, Europeans and British imperialism encompassing the struggle for land, resources and political power. The history and archaeology of the greater Lethabong and Kempton Park area is well known for its Iron Age Farmer Period, Historical Period as well as industrial archaeological horizons. An examination of historical aerial imagery and archive maps indicate that large portions of the project area subject to this assessment have been altered and transformed as a result of historical agriculture and more recent surface clearing, urban development, industrialization and refuse dumping. During the survey, no heritage receptors were noted in the project footprint and it might be assumed that this site is favorable for development. This inference is made on the assumption that no previously-undetected heritage remains are encountered during pre-construction vegetation clearing, earth moving activities and construction.

8.3 RIVER AND WETLAND ECOSYSTEM ASSESSMENT

8.3.1 TERMS OF REFERENCE

The specialist assessment sought to identify and delineate all watercourses within 100 m and wetlands within 500 m of the project site and assess these in terms of their health / functionality and functional / ecological importance. The terms of reference for the assessment were therefore specified as follows:

- Undertake a desktop assessment of the freshwater ecosystem (watercourse and wetland) context using available national and regional spatial datasets, assessments, and classifications;
- Undertake a desktop screening of all wetlands, rivers and other watercourses within 500m of the project site that are likely to be negatively impacted by the project and confirmation of the study area for infield investigation. The remaining watercourses within 500m were mapped and classified at a desktop level only;
- Delineate the wetlands and riparian zones according to the national wetland and riparian zone delineation guidelines (DWAF, 2005);
- Classify the wetlands and rivers according to the national aquatic ecosystem classification system (Ollis et al., 2013);
- Assess the importance of the ecosystem services provided by the delineated wetland and riparian zones;
- Assess of the Ecological Importance and Sensitivity (EIS) of the delineated wetlands and rivers using published assessment tools;
- Identify, describe and assess the potential and likely direct and indirect impacts of the project on local wetlands and rivers, including cumulative impacts;
- Provide the project design, construction phase and operational phase mitigation measures to avoid, minimize and/or rehabilitate the potential impacts;
- Assess the significance of the potential impacts of the project on wetland and river ecosystems using a structured assessment method;
- Assess the qualitative risk of the proposed development activities on wetlands and rivers using the DWS risk matrix for Section 21(c) and 21(i) water uses; and
- Determine any outright fatal flaws associated with the project.

8.3.2 KEY FINDINGS

The site assessment was conducted on 20 August 2021. Although not recorded in the NFEPA (2014) and NBA (2018) spatial datasets, three wetland units were identified on site within 500 m of the proposed powerline, including one channelled valley bottom and two seeps. The delineation map of the wetland units is provided in Figure 8-1 below.

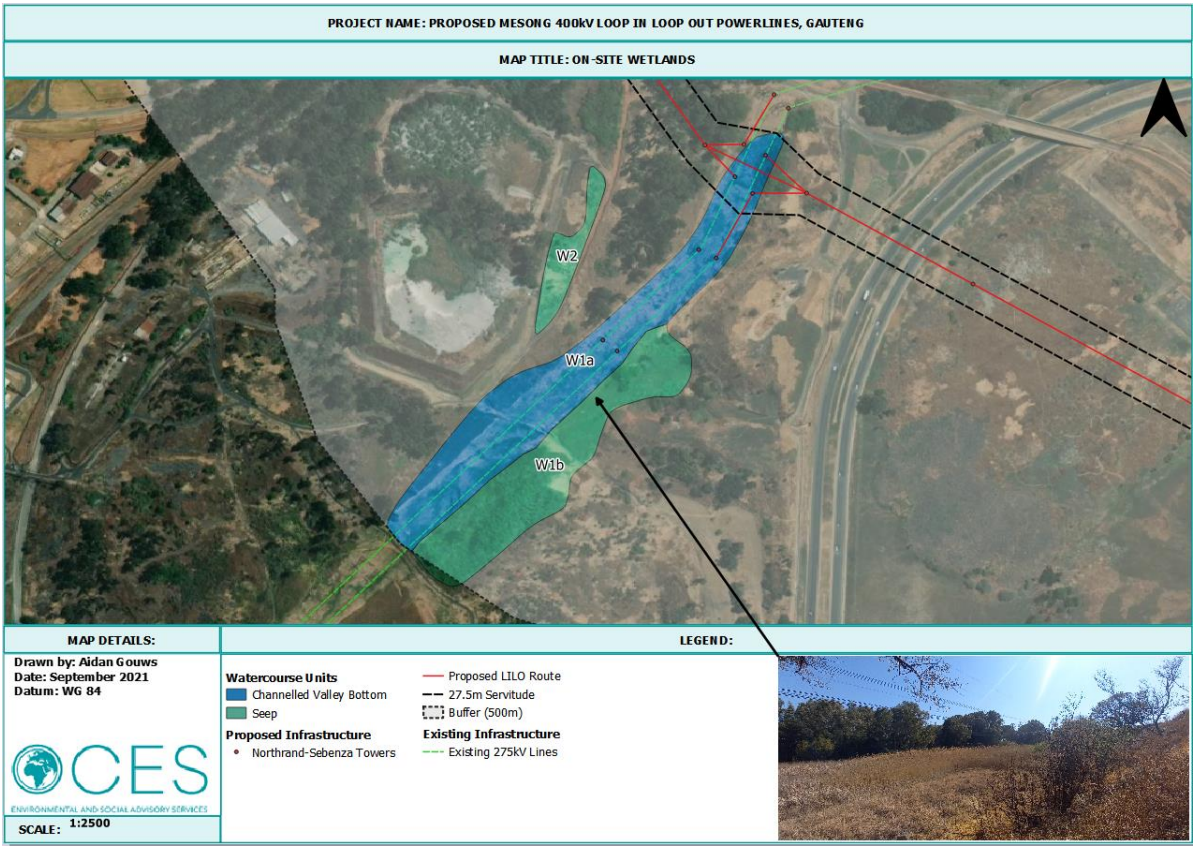


Figure 8-1: Assessment units potentially affected by the proposed development.

Of the three wetland units, two are in a critically-modified condition (PES Classes E/F) and one is in a largely-modified condition (PES Class D). The catchments of all units have been impacted by residential urban development, industry and mining operations. Within wetland impacts include scattered alien vegetation (such as Acacia dealbata, Arundo donax and Solanum mauritianum) and Eucalyptus camaldulensis tree plantations, as well as erosion and infilling in surrounding the existing powerline pylons. The majority of the ecosystem services were rated as very low to low in terms of their overall importance. Ecosystem services scoring moderately low to moderate include sediment, nitrate and toxicant trapping, as well as harvestable resources and food for livestock services. The supply of sediment, nitrate and toxicant trapping services is attributed to the abundance of reedland vegetation across much of the assessment units, providing a relatively high resistance to water flow, contributing the dispersion of low flow patterns.

The wetlands were found to be of moderately low to moderate Ecological Importance and Sensitivity (EIS).

8.4 TERRESTRIAL BIODIVERSITY ASSESSMENT

8.4.1 TERMS OF REFERENCE

The specialist assessment sought to assess the ecological state and current land-use of the proposed site, identify potential sensitive ecosystems, animal and plant species, and identify potential impacts of the proposed development. The objectives for the ecological assessment were as follows:

- Describe and map the vegetation types in the study area.
- Describe the biodiversity and ecological state of each vegetation unit.
- Establish and map sensitive vegetation areas showing the suitability for development and no-go areas.
- Identify plant and animal species of conservation concern (Red Data List, PNCO and TOPS lists). In the case of the fauna, this was done at a desktop level.
- Identify alien plant species, assess the invasive potential and recommend management procedures.
- Identify and assess the impacts of development on the site's natural vegetation and faunal species in terms of habitat loss, fragmentation and degradation of key ecosystems and, where feasible, provide mitigation measures to reduce these impacts.

8.4.2 KEY FINDINGS

The on-site vegetation and habitat composition were assessed along 12 transect lines, with an additional 19 point localities sampled across the development footprint. Field data was further supplemented by data collected concurrently during the wetland site survey (20 August 2021). The vegetation and land use types within the assessment footprint (500 m buffer) were then mapped using a combination of data from the field assessment, the Mucina and Rutherford (2018) vegetation map, the National Land Cover (NLC, 2018) map and aerial imagery from Google Earth (Figure 8.2). The vegetation and land use types recorded within the assessment footprint are described in Appendix A2, along with photographic examples of the site conditions and species for each category.

A total of 24 plants were identified during the site visit, none of which were Species of Conservation Concern (SCC), with all categorised as "**Least Concern**". Fourteen species were categorised as non-indigenous species, of which nine are Category 1b invaders, three are Category 2 invaders and two are Category 2 invaders in terms of the NEMBA AIS List (2016).

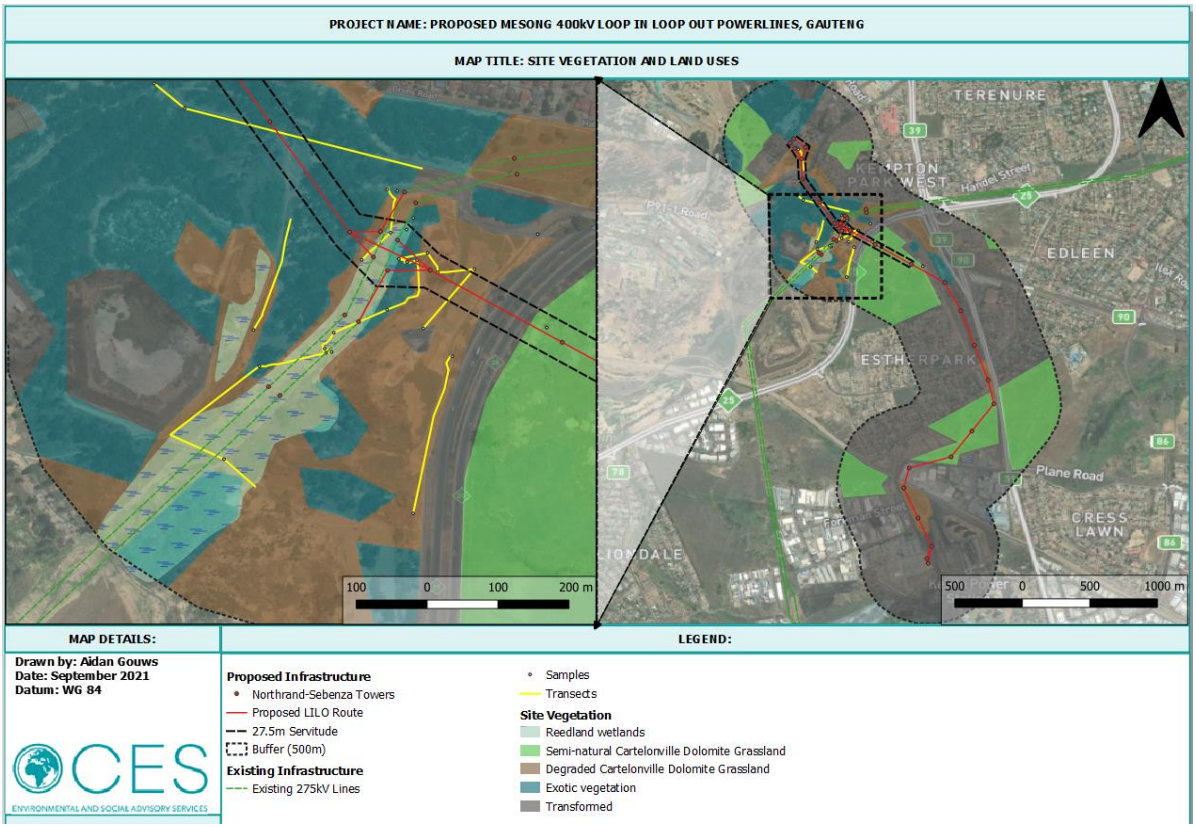


Figure 8.2: Site vegetation and land use map of the proposed development sites

9 SENSITIVITY ANALYSIS

A site sensitivity analysis has been conducted based on specialist and general site information gathered. The site was classified into areas of low, conditional sensitivity and **NO-GO** development.

- **NO-GO** includes areas where no construction should take place.
- **High Sensitivity** areas will require considerable effort to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general these areas should be avoided. Only facilities that are location dependent should be permitted in these areas.
- **Moderate Sensitivity** areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology and design will be required to reduce impacts and ensure sustainability.
- **Low Sensitivity** areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMP).

9.1 AQUATIC BIODIVERSITY ECOLOGICAL IMPOIRTANCE AND SENSITIVITY (EIS)

This section discusses the results of the Ecological Importance and Sensitivity (EIS) assessments. The wetlands were assessed using the Wetland EIS tool. Units W1a and W2 scored moderately low, whereas W1b scoring marginally higher with a moderate EIS score. This is attributed to regulating services (sediment and nutrient trapping) and provisioning (harvestable resources and food for livestock) services provided by these units. The EIS assessment results are summarised in Table 9.1 below. A sensitivity map (Figure 9.1 below) was developed based on the above EIS ratings.

Table 9.1: Summary of EIS scores and ratings

UNIT	ECOLOGICAL IMPORTANCE SCORE			ECOLOGICAL SENSITIVITY	INTEGRATED EIS SCORE	INTEGRATED EIS RATING
	BIODIVERSITY MAINTENANCE	REGULATING SERVICES	PROVISIONING AND CULTURAL SERVICES			
W1a	0.5	1.5	1.5	1.5	1.5	Moderately low
W1b	0.3	1.8	1.5	0.8	1.8	Moderate
W2	0.0	1.5	1.5	1.0	1.5	Moderately low

9.2 TERRESTRIAL BIODIVERSITY SITE ECOLOGICAL IMPORTANCE (SEI)

The method used to assess site sensitivity has been described in Section 2.3 of the Terrestrial Biodiversity Assessment (CES, 2022). Table 9.2 provides a summary of how each vegetation type was assessed. Based on their Site Ecological Importance (SEI) ratings, wetland vegetation was assigned MEDIUM sensitivity, the semi-natural CDG vegetation was assigned Low sensitivity, and the degraded CDG vegetation, exotic vegetation and transformed areas were assigned Very Low sensitivities. The wetland and CDG vegetation types received MEDIUM Conservation Importance (CI) scores, attributed to the moderate to high likelihood of one or more Species of Conservation Concern (SCC) occurring

within these areas. The exotic vegetation and transformed areas scored low and very low in terms of CI, due to the highly unlikely occurrence of SCCs and the limited to no remaining natural habitat in these areas.

The Functional Integrity (FI) of the ecosystems varied amongst vegetation types, with a MEDIUM rating obtained by wetlands and semi-natural CDG, and a low rating by degraded CDG, exotic vegetation and transformed areas. These scores were attributed to the generally limited connectivity and intactness of the ecosystems within the vegetation types.

The CDG and exotic vegetation both received high receptor resilience (RR) scores. According to Cadman, *et al.* (2013, p. 38), "*changes in species composition and structure resulting from poor rangeland management are generally reversible in the short to mid-term (5-20 years), especially if the primary grassland species (forbs and grasses) are still scattered across the grassland, even in low numbers . . . Dry Highveld ecosystems* [such as the CDG] *will generally recover more quickly than mesic ones as they are dominated by plants that recruit more often from seeds stored in the seed bank, depending on rainfall."* The wetland vegetation and transformed areas were assigned a MEDIUM RR scores.

Table 9.2: Evaluation of Site Ecological Importance (SEI) of habitat and SCC

HABITAT/ SPECIES	CONSERVATION IMPORTANCE (CI)	FUNCTIONAL INTEGRITY (FI)	RECEPTOR RESILIENCE (RR)	SEI
Reedland Wetlands	**MEDIUM** Moderate likelihood of one CR plant species (*Brachycorythis conica transvaalensis*), with an EOO > 10 km² (26.75 km²) but fewer than 10 000 mature individuals remaining. Moderate to high likelihood of one EN plant species (Sensitive Species A), with an EOO > 10 km² (152.23 km²) but fewer than 10 000 mature individuals remaining (~230) and a distribution range which includes the project area.	**MEDIUM** Medium (~6.6 ha) partially-intact area of semi-natural to degraded ecosystem. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity. Mostly moderate current negative impacts and a few signs of minor to moderate past disturbance. Moderate rehabilitation potential.	**MEDIUM** These areas will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	**MEDIUM**
Semi-natural CDG	**MEDIUM** Moderate likelihood of one CR plant species (*Brachycorythis conica transvaalensis*), with an EOO > 10 km² (26.75 km²) but fewer than 10 000 mature individuals remaining. Moderate to high likelihood of one EN plant species (Sensitive Species A), with an EOO > 10 km² (152.23 km²) but fewer than 10 000 mature individuals remaining (~230) and a distribution range which includes the project area. Moderate likelihood of five VU aniumal species (*Chrysospalax villosus, Cloeotis percivali, Crocidura maquassiensis, Felis nigripes* and *Mystromys albicaudatus*) occurring within the vegetation type.	**MEDIUM** Very large (~107.3 ha) partially-intact area of semi-natural LC ecosystem type. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity. Mostly minor to moderate current negative impacts and a few signs of minor to moderate past disturbance. Moderate rehabilitation potential.	**HIGH** The CDG habitats are Dry Highveld ecosystems, dominated by grasses and are therefore likely to recover relatively quickly and retain a high degree of the original species composition and functionality.	**LOW**
Degraded CDG		**LOW** Large (~41.8 ha) area of degraded LC ecosystem type. Limited habitat connectivity but migrations still possible across some modified or degraded natural habitat. Low to moderate rehabilitation potential. Several moderate and major current negative ecological impacts.		**VERY LOW**

Exotic vegetation	**LOW**	**LOW**	**HIGH**	**VERY LOW**
	No confirmed and highly unlikely populations of SCC and/or range-restricted species. Less than 50 % of receptor contains natural habitat with limited potential to support SCC.	Large (~53.1 ha) area of invaded LC ecosystem type. Limited habitat connectivity but migrations still possible across some modified or degraded natural habitat. Low to moderate rehabilitation potential. Several moderate and major current negative ecological impacts.	The exotic vegetation patched on site fall within the broader DCG vegetation type. The CDG habitats are Dry Highveld ecosystems, dominated by grasses and are therefore likely to recover relatively quickly and retain a high degree of the original species composition and functionality.	
Transformed areas	**VERY LOW**	**LOW**	**MEDIUM**	**VERY LOW**
	No confirmed and highly unlikely populations of SCC and/or range-restricted species. Little to no natural habitat remaining.	Very large (~327.3 ha) transformed areas with almost no habitat connectivity, but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low to moderate rehabilitation potential. Several minor and major current negative ecological impacts.	Given the high degree of transformation, these areas will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	

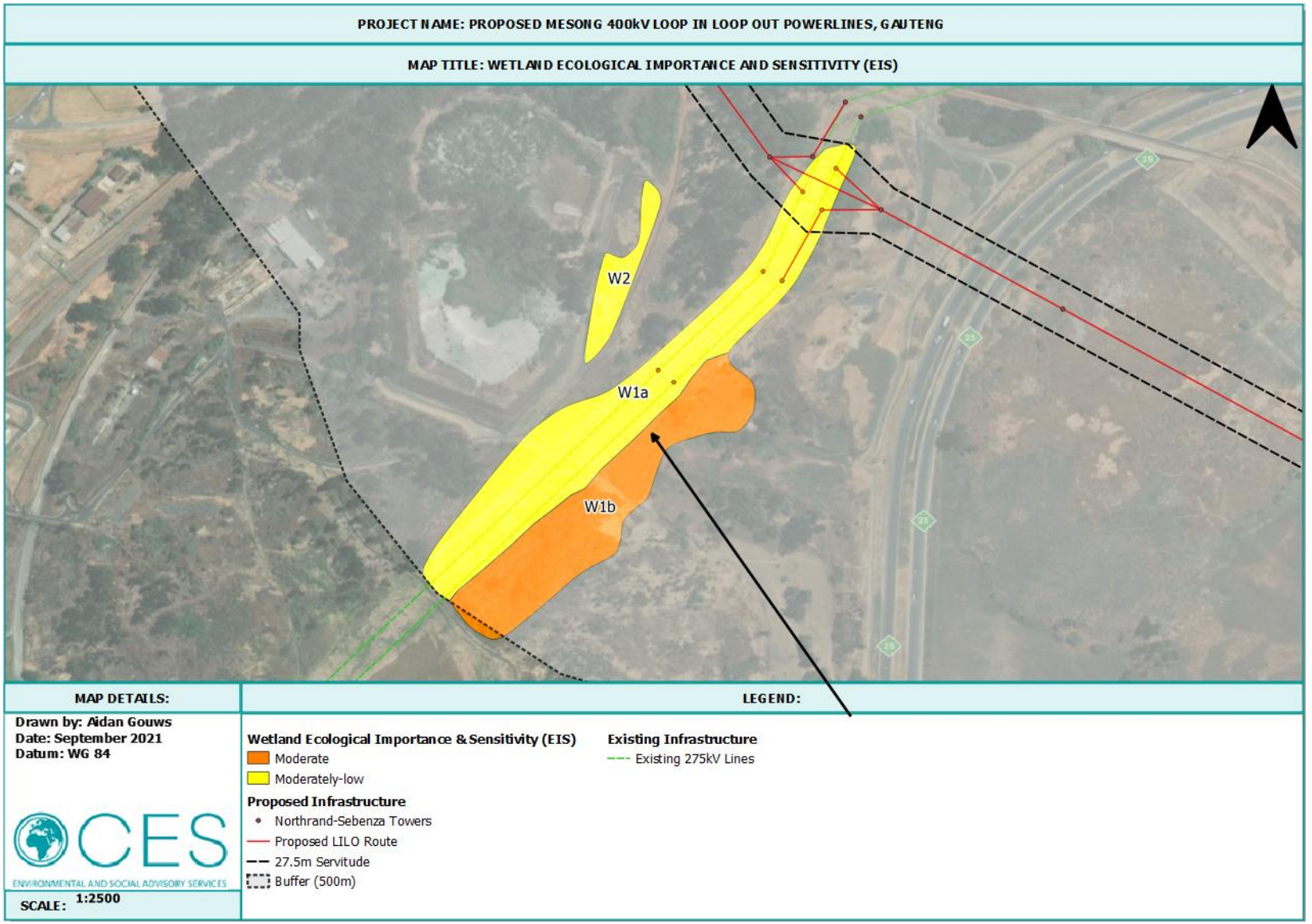


Figure 9.1: Ecological Importance and Sensitivity (EIS) map of the proposed development site.

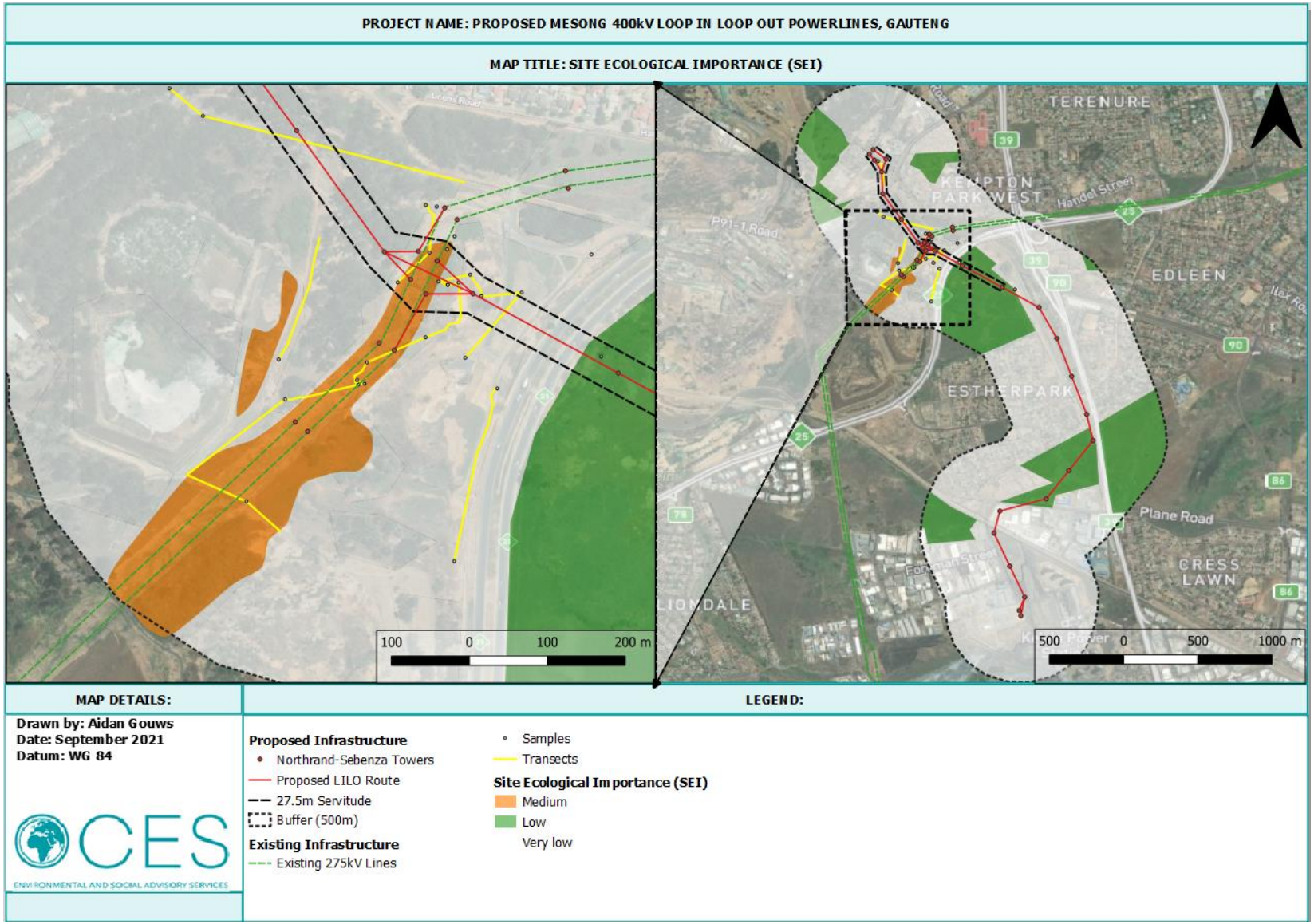


Figure 9.2: Terrestrial Biodiversity Site Ecological Importance (SEI) map of the proposed development area.

10 IMPACT ASSESSMENT METHODOLOGY

10.1 AIMS OF ENVIRONMENTAL IMPACT ASSESSMENT

The aim of Basic Assessments and Environmental Impact Assessments is to determine the consequences of proposed developments on the environments to better inform decision-making and the management of natural and social systems. This BA sought to assess the potential environmental impacts of the proposed development of the 400 kV Powerline, between Ekurhuleni and Johannesburg district municipalities.

10.2 IMPACT ASSESSMENT CRITERIA

CES has developed evaluation criteria for assessing impacts in accordance with the requirements outlined in Appendix 2 of the EIA Regulations (2014, as amended). This scale takes into consideration the following variables:

- Nature: negative or positive impact on the environment.
- Type: direct, indirect and/or cumulative effect of impact on the environment.
- Significance: The criteria in Table 10-1 are used to determine the overall significance of an activity. The impact effect (which includes duration; extent; consequence and probability) and the reversibility/mitigation of the impact are then read off the significance matrix in order to determine the overall significance of the issue. The overall significance is either negative or positive and will be classified as low, moderate or high (Table 10-2).
- Consequence: the consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.
- Extent: the spatial scale defines the physical extent of the impact.
- Duration: the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Probability: the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
- Reversibility: The degree to which an environment can be returned to its original/partially original state.
- Irreplaceable loss: The degree of loss which an impact may cause.
- Mitigation potential: The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 10-1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 10-1: Ranking of Evaluation Criteria

Nature	
Positive	Beneficial/positive impact.
Negative	Detrimental/negative impact.
Type	
Direct	Direct interaction of an activity with the environment.

Indirect	Impacts on the environment that are not a direct result of the project or activity.
Cumulative	Impacts which may result from a combination of impacts of this project and similar related projects.
Duration	
Short term	Less than 5 years.
Medium term	Between 5-20 years.
Long term	More than 20 years.
Permanent	Over 40 years or resulting in a permanent and lasting change that will always be there.
Extent	
Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
Study area	The proposed site and its immediate environments.
Municipal	Impacts affect the municipality, or any towns within the municipality.
Regional	Impacts affect the wider district municipality or the Eastern Cape Province as a whole.
National	Impacts affect the entire country.
International/Global	Impacts affect other countries or have a global influence.
Consequence	
Slight	Slight impacts or benefits on the affected system(s) or party(ies).
Moderate	Moderate impacts or benefits on the affected system(s) or party(ies).
Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies).
Probability	
Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
Reversibility	
Reversible	The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.
Irreversible	The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.
Irreplaceable loss	
Resource will not be lost	The resource will not be lost/destroyed provided mitigation measures are implemented.
Resource will be partly lost	The resource will be partially destroyed even though mitigation measures are implemented.
Resource will be lost	The resource will be lost despite the implementation of mitigation measures.
Mitigation potential	
Easily achievable	The impact can be easily, effectively and cost effectively mitigated/reversed.
Achievable	The impact can be effectively mitigated/reversed without much difficulty or cost.
Difficult	The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs.
Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.

Table 10-2: Description of significance ratings

Significance Rating		Description
LOW NEGATIVE	**LOW POSITIVE**	The impacts on this issue are acceptable and mitigation, whilst desirable, is not essential. The impacts on the issue by themselves are insufficient, even in combination with other low impacts, to prevent the development being approved. Impacts on this particular issue will result in either positive or negative medium to short term effects on the social and/or natural environment.
MODERATE NEGATIVE	**MODERATE POSITIVE**	The impacts on this issue are important and require mitigation. The impacts on this issue are, by themselves, insufficient to prevent the implementation of the project, but could in conjunction with other issues with moderate impacts, prevent its implementation. Impacts on this particular issue will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
HIGH NEGATIVE	**HIGH POSITIVE**	The impacts on this issue are serious, and if not mitigated, they may prevent the implementation of the project (if it is a negative impact). Impacts on this particular issue would be considered by society as constituting a major and usually a long-term change to the (natural and/or social) environment, and will result in severe effects or if positive, substantial beneficial effects.

10.3 ASSESSMENT OF CUMULATIVE IMPACTS

In terms of the NEMA EIA Regulations (2014), a cumulative impact is defined as:
"The past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities".

Project induced cumulative impacts should be considered, along with direct and indirect impacts, in order to better inform the developer's decision making and project development process. Cumulative impacts may be categorised into one or more of the following types:

- **Additive:** the simple sum of all the effects (e.g. the accumulation of ground water pollution from various developments over time leading to a decrease in the economic potential of the resource);
- **Synergistic:** effects interact to produce a total effect greater than the sum of individual effects. These effects often happen as habitats or resources approach capacity (e.g. the accumulation of water, air and land degradation over time leading to a decrease in the economic potential of an area);
- **Time crowding:** frequent, repetitive impacts on a particular resource at the same time (e.g. multiple boreholes decreasing the value of water resources);
- **Neutralizing:** where effects may counteract each other to reduce the overall effect (e.g. infilling of a wetland for road construction, and creation of new wetlands for water treatment); and,
- **Space crowding:** high spatial density of impacts on an ecosystem (e.g. rapid informal residential settlement)."

Cumulative impacts are, however, difficult to accurately and confidently assess, owing to the high degree of uncertainty, as well as their often being based on assumptions. It is therefore difficult to

provide as detailed an assessment of cumulative impacts as is the case for direct and indirect project induced impacts. This is usually because of the absence of specific details and information related to cumulative impacts. In these situations, the EAP will need to ensure that any assumptions made as part of the assessment are made clear. Accordingly, this includes an overview and analysis of cumulative impacts related to a variety of project actions, and does not provide a significance rating for these impacts, as was done for direct project induced impacts. The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. It is important to realise these constraints, and to recognise that the assessment will not, and indeed cannot, be perfect. The potential for cumulative impacts will, however, be considered, rather than omitted from the decision making-process and is therefore of value to the project and the environment.

11 IMPACT ASSESSMENT

The impact assessment identified and assessed impacts across four phases of development:

- Planning & Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

An impact assessment was conducted based on site visits and information provided by Eskom Holdings SOC Ltd relating to the planning, construction and operation phases, as well as the no-go alternative, for the 400 kV Powerline A detailed impact assessment of all the identified impacts is provided in Appendix B. A breakdown of the assessment and mitigation measures is presented in the tables below.

11.1 PLANNING AND DESIGN PHASE IMPACTS

Table 11-1: Summary of impacts associated with the proposed 400 kV Powerline during the planning and design phase.

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
ENVIRONMENTAL POLICY					
Legal and policy compliance	All Alternatives	During the planning and design phase, failure to adhere to existing policies and legal obligations and obtain the necessary authorisations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH -**	• All relevant legislation and policy must be consulted and the proponent must ensure that the project is compliant with such legislation and policy. • These should include (but are not restricted to): NEMA and Local Municipal bylaws. • All relevant permits and authorisations including Water Use Licences or General Authorisations, Building Plan Approvals and plant removal permits must be in place prior to commencement of construction.	**LOW -**
BUILT ENVIRONMENT					
Infrastructure	All Alternatives	During the planning and design phase, planning and placement of structures and associated infrastructure in sensitive areas could lead to the damage and degradation of natural areas as well as to the structures themselves.	**MODERATE -**	• Planning for and placement of infrastructure must be done so as to avoid sensitive areas as far as possible.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Stormwater management	All Alternatives	During the planning and design phase, inadequate planning for stormwater during the construction and operational phases within the site could result in erosion and contamination of the soil and surrounding watercourses if there are not appropriate stormwater management structures in place.	**MODERATE -**	• A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must be approved by the appointed ECO. • This method statement should include stormwater management considerations to control runoff prevent erosion of the site and its surroundings, and mitigate the unnecessary loss of soil and sedimentation of watercourses during all phases of the project. • Regular monitoring of implementation of this method statement for the rehabilitation of disturbed areas must be conducted. • Appropriate stormwater structures, in alignment with the method statement, must be designed to minimise erosion of the surrounding environment to the extent required	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Waste management	All Alternatives	During the planning and design phase, failure to plan for the storage, handling and disposal of general and hazardous waste during the construction and operation phase may lead to littering and pollution of the surrounding environment, unsanitary conditions and health risks.	**MODERATE -**	• A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must be approved by the appointed ECO. • This method statement should include waste management considerations for handling onsite general and hazardous waste during the construction and operation phases must be developed and implemented during construction. • An appropriate area must be identified where waste can be stored before disposal. • All hazardous substances such as paints, diesel and cement must be stored in a secure bunded area with an impermeable surface beneath them.	**LOW -**
SOCIO-ECONOMIC					
Job creation	All Alternatives	During the planning and design phase, there will be some temporary job opportunities associated with planning and design of the proposed 400 kV LILO Line.	**LOW +**	N/A	**LOW +**
Health and safety	All Alternatives	During the planning and design phase, failure to plan for potential health and safety risks during the construction and operation phase may result in the harm of labourers, staff, surrounding landowners and the public.	**MODERATE -**	A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be drawn up by and HSE officer prior to construction to ensure workers safety.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE		SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
On-site fire risk	All Alternatives	During the planning and design phase, failure to plan for accidental fires during the construction and operation phase could result in potential harm to the public and/or surrounding landowners and their property.		**MODERATE -**	• Emergency preparedness must be in place for both the construction and operational phases and before these phases commence. This should form part of the method statement. • Eskom Holdings SOC must plan for and put measures in place to prevent and deal with fires including the provision of firefighting equipment.	**LOW -**
Traffic	All Alternatives	During the planning and design phase, inadequate planning for the transportation of mast materials and specialist construction equipment to the site could cause traffic congestion.		**MODERATE -**	• Consultation with the local Road Traffic Unit should be done early in the planning phase and if deemed necessary, road traffic permits should be obtained for transporting parts, containers, materials and construction equipment to the site to the extent required. • Make provision for traffic accommodation where construction activities impact on existing roads.	**LOW -**
REHABILITATION AND MAINTENANCE						
Inadequate rehabilitation and maintenance	All Alternatives	During the planning and design phase, inadequate planning for rehabilitation and maintenance of infrastructure could lead to degradation of the study area and surrounding areas.		**MODERATE -**	• A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.	**LOW -**
TERRESTRIAL BIODIVERSITY						
Loss of vegetation to pylons / towers	Preferred Alternative	The planned layout and siting of construction activities and infrastructure will directly result in the destruction and permanent loss of vegetation. The consequence and significance of this impact depends on the pre-construction SEI of the vegetation.	Loss of medium SEI vegetation (wetland)	**MODERATE -**	Minimize/reduce impact: • During the planning and design phase, the development footprint must be designed to minimize the loss of near- to semi-natural indigenous vegetation as far as possible. • The development footprint must be clearly demarcated and only vegetation within the	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE		SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
			Loss of low SEI vegetation (semi-natural CDG)	**LOW -**	approved footprint may be removed. Vegetation outside of these areas may not be cleared. Remediate/rehabilitate impact: • A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.	**VERY LOW -**
			Loss of very low SEI vegetation (degraded CDG, exotic vegetation and transformed areas)	**VERY LOW -**		**VERY LOW -**
Non-compliance with permitting requirements	Preferred Alternative	During the planning and design phase, the inadequate planning for search and rescue operations and permitting for the removal of any SCC may result in non-compliances being issued and the unintended loss of SCC.		**MODERATE -**	Avoid/prevent impact: • Planning for any search and rescue operations must be conducted prior to the commencement of construction activities. • All necessary permits must be obtained for the removal of any identified SCC prior to the commencement of construction activities.	**VERY LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Disruption of Ecosystem Function and Processes	Preferred Alternative	The planned layout and siting of construction activities and infrastructure will result in the disruption of ecosystem functions and processes, including the loss of ecological connectivity and edge disturbance impacts.	**MODERATE -**	Minimize/reduce impact: • During the planning and design phase, the development footprint must be designed to minimize edge disturbance impacts. Remediate/rehabilitate impact: • A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.	**LOW -**
Establishment and/or spread of Alien Plant Species	Preferred Alternative	During the planning and design phase, the failure to plan for the removal and management of alien vegetation could result in the invasion of alien vegetation in sensitive areas during the construction and operational phases.	**MODERATE -**	Minimize/reduce impact: • An Alien Vegetation Management Plan must be developed by the Contractor prior to construction to mitigate the establishment and spread of undesirable alien plant species during all phases of the project. • The Alien Vegetation Management Plan must be approved by the appointed ECO prior to implementation. Remediate/rehabilitate impact: • A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.	**LOW -**

11.2 CONSTRUCTION PHASE IMPACTS

Table 11-2: Summary of impacts associated with the proposed 400 kV LILO Powerline during the construction phase.

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
ENVIRONMENTAL POLICY					
Legal and policy compliance	All Alternatives	During the construction phase, failure to adhere to existing policies and legal obligations and obtain the necessary authorisations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH -**	• All construction related conditions in the Environmental Authorisation, EMPr and other permits must be adhered to. • Eskom Holdings SOC must employ an independent Environmental Control Officer (ECO) for the construction phase to ensure that construction is implemented according to specifications in the EA and EMPr. • Copies of all applicable licenses, permits and managements plans (EA, EMPr, etc.) must be available on-site at all times. • Environmental Awareness Training must be included in site meetings/talks with all workers.	**LOW -**
BUILT ENVIRONMENT					
Infrastructure	All Alternatives	During the construction phase, the disturbance/clearing of vegetation and construction activities within or within close proximity to sensitive areas may result in degradation of the surrounding environment.	**MODERATE -**	• Vegetation clearance must be limited to the area within the footprint of the designated area. • Vegetation disturbance outside of the development footprint should be minimized.	**LOW -**
Material stockpiling	All Alternatives	During the construction phase, inappropriate location and management of material stockpiles may result in erosion.	**MODERATE -**	• Material stockpiles must be located away from sensitive areas and they must be monitored for erosion and alien vegetation. • Material stockpile locations must be approved by the ECO.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Stormwater management	All Alternatives	During the construction phase, failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of stormwater and resulting surrounding watercourses.	**MODERATE -**	• The construction site must be managed in a manner that prevents pollution to downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants. • Berms and swathes must be placed in areas that may be prone to erosion. • Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.	**LOW -**
Waste management	All Alternatives	During the construction phase, poor management of handling, disposal and storage of general and hazardous waste may lead to the pollution of the surrounding environment.	**MODERATE -**	• All general waste must be disposed of in bins/waste skips labelled “general waste”. • Sufficient waste bins must be provided throughout the construction site for collecting waste. • All general waste collected on site must be disposed of at a licensed general waste disposal site. • All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider. • Proof of receipt of hazardous waste by a licenced service provider must be maintained on the site. • Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground. • Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
		During the construction phase, the mixing of cement on site could result in ground water contamination from compounds in the cement. In addition, a large number of cement mixing stations on site could increase the presence of impermeable areas which in turn could increase rates of run-off and thereby increase the risk of localized flooding, soil erosion, silting, gully formation, etc.	**MODERATE -**	• Concrete and cement must take place on an impermeable surface, and dried waste concrete and cement must be disposed of with building rubble. • No concrete mixing must take place within 32 m of any watercourse.	**LOW -**
SOCIO-ECONOMIC					
Job creation	All Alternatives	During the construction phase, there will be some temporary job opportunities associated with building of the proposed 400 KV LILO Line.	**LOW +**	• N/A	**LOW +**
Health and safety	All Alternatives	During the construction phase, failure to comply with health and safety policies and protocols may result in the harm of labourers, staff, surrounding landowners and the public.	**MODERATE -**	• A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be adhered to and enforced by a HSE officer to ensure workers safety.	**LOW -**
Air quality and dust control	All Alternatives	During the construction phase, dust generated by construction vehicles and construction activities could result in significant dust during windy conditions.	**MODERATE -**	• During windy periods un-surfaced and un-vegetated areas must be dampened down. • Vegetation must be retained where possible as this will reduce dust travel. • Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register. • Vehicles and construction plant must be serviced regularly so as to reduce excessive vehicle emissions.	**LOW -**
	All Alternatives	During the construction phase poor maintenance and servicing of construction plant and vehicles may result in an increase in vehicle emissions in the areas.	**MODERATE -**		**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE		SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
On-site fire risk	All Alternatives	During the construction phase inadequate attention to fire safety awareness and fire safety equipment could result in uncontrolled fires, posing a threat to animals, vegetation and the surrounding landowners.		**MODERATE -**	In order to reduce the risk of fires: • All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances. • Smoking must not be permitted near flammable substances. • All cooking must be done in demarcated areas that are safe in terms of runaway or uncontrolled fires. • No open fires must be allowed on site. • Fire extinguishers must be available onsite.	**LOW -**
REHABILITATION AND MAINTENANCE						
Inadequate rehabilitation and maintenance	All Alternatives	During the construction phase inadequate provision and implementation of rehabilitation measures may lead to the degradation of the surrounding environment.		**MODERATE -**	The rehabilitation plan must be implemented during and after the construction has been completed.	**LOW -**
TERRESTRIAL BIODIVERSITY AND ECOLOGY IMPACTS						
Loss of vegetation to pylons / towers	Preferred Alternative	The clearing of land for the construction of the powerline pylons / towers will result in the loss of vegetation. The consequence and significance of this impact depends on the pre-construction SEI of the vegetation.	Loss of medium SEI vegetation (wetland)	**MODERATE -**	Avoid/prevent impact: • Implement mitigation measures during planning and design phase. • Areas of very high sensitivity must be avoided. Minimize/reduce impact: • Construction activities must remain within the approved demarcated development footprint, and no vegetation clearance is to be permitted outside of the approved development footprint.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE		SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
			Loss of low SEI vegetation (semi-natural CDG)	**LOW -**	• Construction vehicles and machinery must not encroach into identified highly-sensitive, 'no-go' areas or areas outside the project footprint. • Activities within 500 m of a wetland must obtain the necessary Water Use Authorisation prior to the commencement of such activities. • Lay down areas must not be located within any watercourses or drainage lines. Remediate/rehabilitate impact: • Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas). • Only indigenous species must be used for rehabilitation. • The alien invasive management plan for the site must be implemented.	**VERY LOW -**
			Loss of very low SEI vegetation (degraded CDG, exotic vegetation and transformed areas)	**VERY LOW -**		**VER LOW -**
	No-go alternative	Should the project not proceed then the current land use will remain the same. Vegetation will likely continue to degrade under current land uses.		**LOW -**		**N/A**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Loss of Plant Species of Conservation Concern	Preferred Alternative	The permanent loss of plant SCCs may occur. The following SCCs have a moderate to high likelihood of occurring within the project area: • *Brachycorythis conica transvaalensis* • *Sensitive species A* It is possible that these species may be lost should the development proceed.	**MODERATE -**	Avoid/prevent impact: • A botanical walkthrough of the development area, by an experienced botanist with knowledge of the SCC identified as possibly occurring within the site, must be undertaken during the flowering season. • If restricted range SCC populations are found, the development must be shifted to avoid these populations. • The ECO must monitor for potential additional plant SCCs not found during search and rescue activities. • Plant SCCs must not be removed from the development footprint unless the relevant permits have been obtained.	**LOW -**
		If populations of SCC with restricted ranges are present within the site and are impacted by the placement of infrastructure, the cumulative impact will be moderate as some SCC have already been lost as a consequence of historical and current land uses in the region. This impact can be reduced if a thorough botanical walkthrough of the site is undertaken during the optimum flowering season.	**MODERATE -**		**LOW -**
	No-go alternative	Under the no-go alternative there will be no clearance of habitat within the project area therefore there will be no loss or impact to faunal SCC.	**LOW -**		**N/A**
Impact on faunal species of conservation concern	Preferred Alternative	The loss of animal species of conservation concern may occur during the construction phase. The following SCCs have a moderate likelihood of occurring within the project area: • *Chrysospalax villosus* ((Rough-haired Golden Mole), • *Cloeotis percivali (*Percival's Short-eared Trident Bat, • *Crocidura maquassiensis* (Makwassie musk shrew), • *Felis nigripes* (Black-footed Cat) *and* • *Mystromys albicaudatus* (White-tailed rat).	**MODERATE -**	Avoid/prevent impact: • All clearing activities must deploy search and rescue teams in-front of clearing machinery to assist in relocating slower moving faunal species e.g. tortoises. • This team should focus on checking termite mounds, burrows and dens in particular for small mammals, such as the Black-footed Cat, shrews and rats.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
		If populations of SCC with restricted ranges are present within the site and are impacted by the placement of infrastructure, the cumulative impact will be moderate as some SCC have already been lost as a consequence of historical and current land uses in the region.	**MODERATE -**		**LOW -**
	No-go alternative	Disturbance from the existing land uses will probably continue should the proposed project not go ahead. This will have a low negative impact on the site, with habitats continuing to degrade.	**LOW -**		**N/A**
Reduced Faunal Habitat	Preferred Alternative	During the construction phase, the construction related activities will result in the loss and/or degradation of natural habitats for fauna.	**MODERATE -**	Minimize/reduce impact: • The contractor must ensure that vegetation clearance of near-natural, semi-natural and wetland vegetation is restricted to the approved development footprint only. • Construction vehicles and machinery must not be permitted outside of the development footprint, as much as practically possible. • Clearing of trees should take place in winter months, to prevent birds and bats establishing nesting grounds and starting to breed and rear young in the spring and summer months. • Employees must be prohibited from making open fires during the construction phase. • The ECO must monitor that all construction activities are conducted within the development footprint.	**LOW -**
		Portions of habitat have already been lost due to historical and current land uses. The additional loss of habitats will have a low cumulative impact.	**LOW -**	Remediate/rehabilitate impact: • All impacted areas must be rehabilitated as per the Rehabilitation Plan, as soon as construction has been completed within each area.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
	No-go alternative	Disturbance from the existing land uses will probably continue should the proposed project not go ahead. This will have a low negative impact on the site, with habitats continuing to degrade.	**LOW -**		**N/A**
Disruption of Ecosystem Function and Process	Preferred Alternative	Construction activities will result in the disruption of ecosystem functions and processes, including the loss of ecological connectivity and edge disturbance impacts. Fragmentation is one of the most important impacts on vegetation as it creates breaks in previously continuous vegetation, causing a reduction in the gene pool and a decrease in species richness and diversity. It also impacts on fauna as it separates habitats and necessitates fauna having to move across exposed areas like roads to get to another section of their habitat or territory. This impact occurs when more and more areas are cleared, resulting in the isolation of functional ecosystems, which results in reduced biodiversity and reduced movement due to the absence of ecological corridors. Given the small footprint of individual powerline pylons and the degraded nature of the proposed substation site, a low significance impact on ecosystem functions and processes is ancticipated.	**LOW -**	Avoid/prevent impact: • Implement mitigation measures during planning and design and construction phases. Minimize/reduce impact: • The contractor must ensure that vegetation clearance of near-natural and wetland vegetation is restricted to the approved development footprint only. • Construction vehicles and machinery must not be permitted outside of the development footprint, as much as practically possible. • Employees must be prohibited from making open fires during the construction phase. Remediate/rehabilitate impact: • A rehabilitation plan must be implemented during construction and operation phases. • All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.	**LOW -**
		Given the relatively high degree of fragmentation across the project area as the result of historical and current land uses, the cumulative impact of the proposed pylons and substation will carry a moderate significance.	**LOW -**		**LOW -**
	No-go alternative	Under the no go alternative, habitat fragmentation has already occurred and will continue to do so.	**LOW -**		**N/A**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Disturbance to faunal species and potential reduction in abundance and mortality of faunal species	Preferred Alternative	Faunal species will be disturbed during construction due to noise and vibrations of construction machinery. Faunal species that vacate the immediate area may return following completion of construction or new individuals or species may inhabit the area. Construction machinery may cause unintentional mortalities of faunal species. Even with the mitigations applied, the construction will still have an impact on faunal species.	**MODERATE -**	Minimize/reduce impact: • Vehicles and machinery must meet best practice standards in terms of noise and vibration. • Staff and contractors' vehicles must comply with speed limits of 40 km/hr • Project must start and be completed within the minimum timeframe, i.e. may not be started and left incomplete. • ECO must walk ahead of clearing construction machinery and move slow moving species e.g. tortoises out of harm's way and into suitable neighbouring habitat. • Any faunal species that may die as a result of construction must be recorded (photographed, GPS coordinate captured) and if somewhat intact preserved and donated to SANBI. • Any faunal species observed onsite must be recorded (photographed, GPS coordinate captured) and loaded onto iNaturalist. • Staff and contractors must not be permitted to capture, collect or eat any faunal species onsite.	**MODERATE -**
		Portions of habitat have already been lost due to historical and current land uses. The additional loss of habitats will have a low cumulative impact.	**MODERATE -**		**LOW -**
	No-go alternative	Disturbance from the existing land uses will probably continue should the proposed project not go ahead. This will have a low negative impact on the site, with habitats continuing to degrade.	**LOW -**		**N/A**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Establishment and/or spread of Alien Plant Species	Preferred Alternative	During the construction phase, the removal of natural vegetation creates open habitats that favour the establishment of undesirable alien plant species. The infestation of alien plant species will result in the displacement of indigenous vegetation and possible local extinctions of species. This pre-mitigation impact is of moderate significance but can easily be managed through the implementation of an alien invasive management plan.	**MODERATE -**	Minimize/reduce impact: • The Contractor must implement the Alien Vegetation Management Plan. The ECO must monitor for the adequate implementation of this plan. • The ECO must monitor the site for the presence of alien invasive plant species and take immediate action when these are recorded. • It is recommended that the ECO prepare a photo guide of all invasive plant species likely to occur on site. This will aid in the identification of undesirable species. Remediate/rehabilitate impact: • All previously infested areas must be rehabilitated as per the Rehabilitation Plan, to the satisfaction of the appointed ECO, as soon as construction has been completed within each area.	**LOW -**
		Disturbance from the existing land uses will likely be exacerbated by the additional impacts of the construction of the proposed substation and associated powerlines. This will be of moderate significance.	**MODERATE -**		**LOW -**
	No-go	Disturbance from the existing alien invasive species on site will probably continue should the proposed project not go ahead. This will have a moderate negative impact on the site.	**MODERATE -**		**N/A**
AGRICULTURAL IMPACTS					
Loss of agricultural infrastructure	All Alternatives	It is hereby confirmed that the entire site is of low sensitivity for agriculture, because its location prevents any agricultural production potential.	**LOW -**	• No mitigation required	**LOW -**
HERITAGE IMPACTS					
Loss of archaeological feature	All Alternatives	The study did not identify any archaeological receptors which will be directly impacted by the proposed project and no impact on archaeological sites or features is anticipated.	**LOW -**	• General Site Monitoring: Regular examination of trenches and excavations for the total duration of construction. • As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Loss of historically significant building and structures All	All Alternatives	The study identified no buildings or structures of historical or heritage significance. For the rest of the project area, the general landscape holds varied significance in terms of the built environment as the area comprises historical farming remnants and relatively newly established industrial zones, settlements and townlands. However, no impact on built environment sites is anticipated.	**LOW -**	• Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material occur in the larger landscape, such resources should be regarded as potentially sensitive in terms of possible subsurface deposits.	**LOW -**
Alternation of cultural landscape	All Alternatives	Generally, the proposed project area and its surrounds are characterised by open fields and farmlands. Further away from the project area, the landscape is typical of the rural north Gauteng with undulating hills with flatter plains in-between. This landscape stretches over many kilometres and the proposed project is unlikely to result in a significant impact on the landscape.	**LOW -**		**LOW -**

Disturbance to graves/human burial sites	All Alternatives	No graves of human burial places were noted during the site investigation the project footprint. In the rural areas of the Gauteng Province graves and cemeteries sometimes occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. The probability of additional and informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.	**LOW -**		**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
RIVER AND WETLAND IMPACTS					
Direct ecosystem modification or destruction / loss impacts	Preferred Alternative	During the construction phase, vegetation clearance, construction vehicle traffic and earthworks may result in the temporary disturbance of units W1a and W2.	**LOW -**	Avoid/prevent impact: • Powerlines should span the extent of watercourses where possible. • Pylons should not be placed within 32 m of watercourses. • All construction phase access and haulage roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads and dirt tracks should be used to access the construction sites if such access routes avoid watercourses. Minimize/reduce impact: • Construction activities should be undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc. • Appropriate stormwater management must be implemented during construction to control run-off, minimize erosion and trap sediment. Such measures include the installation of sediment fences, earthen / sand bag barriers at regular intervals. • Vegetation clearing must be kept a minimum and only to the site footprint. • Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses. • Stockpiles must not exceed 1.5m in height. Stockpiles must be covered during windy periods.	**VERY LOW -**
		During the construction phase, vegetation clearance, construction vehicle traffic and earthworks may result in the temporary disturbance of units W1b.	**MODERATE -**		**LOW -**
Alteration of hydrological and geo-morphological processes	Preferred Alternative	During the construction phase, the clearance of vegetation and compaction of soil may result in increased run-off and erosion, altering hydrological and geomorphological processes.	**LOW -**		**VERY LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Ecological connectivity and edge disturbance impacts	Preferred Alternative	During the construction phase, vegetation clearance, construction vehicle traffic and earthworks may reduce ecological connectivity and disturb the watercourse/terrestrial edge.	**LOW -**	Remediate/rehabilitate impact: • Disturbed areas must be monitored for erosion and these must be rehabilitated. • All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.	**VERY LOW -**
Water pollution impacts	Preferred Alternative	During the construction phase, accidental spillages of wet concrete and chemical / hazardous substances may result in soil and groundwater contamination, adversely affecting the aquatic ecosystems in the broader area.	**LOW -**	Avoid/prevent impact: • No concrete mixing must take place within of any watercourse. • No machinery must be parked overnight within 50 m of the rivers/wetlands. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp. • No ablution facilities must be located within 50 m of any river or wetland system. • Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution. • Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. • All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site. Remediate/rehabilitate impact: • Emergency plans must be in place in case of spillages onto bare soil or within water courses.	**VERY LOW -**

11.3 OPERATIONAL PHASE IMPACTS

Table 11-3: Summary of impacts associated with the proposed 400 kV LILO Powerline during the operational phase.

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
ENVIRONMENTAL POLICY					
Legal and policy compliance	All Alternatives	During the operation phase, failure to adhere to all permits, authorisations and regulations may lead to financial penalties and closure of the proposed 400 KV LILO Line.	**HIGH -**	• The proponent must ensure that operations of the 400 KV LILO Line.is compliant with the relevant legislation and policy. • These should include (but are not restricted to): NEMA, EA, EMPr and any other permits/authorisations.	**LOW -**
BUILT ENVIRONMENT					
Infrastructure	All Alternatives	During the operation phase, the Overhead line will provide electricity in an efficient and sustainable manner, including its generation, transmission and distribution and retail.	**LOW +**	• Regular maintenance and inspections of all infrastructure and services must be undertaken.	**LOW +**
Stormwater management	All Alternatives	During the operation phase, failure of the stormwater system and or lack of maintenance of the stormwater system may result in the erosion and or pollution of the surrounding environment should the stormwater be contaminated.	**MODERATE -**	• Stormwater management measures such as attenuation structures, channels, etc. must be properly maintained and monitored. • If the stormwater management measures put in place are deemed insufficient, a qualified engineer must be approached to assist with additional storm water attenuation mechanisms and remediation.	**LOW -**
SOCIO-ECONOMIC					
Job creation	All Alternatives	During the construction phase, there will be some temporary job opportunities associated with building of the proposed 400 KV LILO Line.	**LOW +**	• N/A	**LOW +**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Health and safety	All Alternatives	During the construction phase, failure to comply with health and safety policies and protocols may result in the harm of labourers, staff, surrounding landowners and the public.	**MODERATE -**	• A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be adhered to and enforced by a HSE officer to ensure workers safety.	**LOW -**
Air quality and dust control	All Alternatives	During the construction phase, dust generated by construction vehicles and construction activities could result in significant dust during windy conditions.	**MODERATE -**	• During windy periods un-surfaced and un-vegetated areas must be dampened down. • Vegetation must be retained where possible as this will reduce dust travel. • Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register. • Vehicles and construction plant must be serviced regularly so as to reduce excessive vehicle emissions.	**LOW -**
	All Alternatives	During the construction phase poor maintenance and servicing of construction plant and vehicles may result in an increase in vehicle emissions in the areas.	**MODERATE -**		**LOW -**
On-site fire risk	All Alternatives	During the construction phase inadequate attention to fire safety awareness and fire safety equipment could result in uncontrolled fires, posing a threat to animals, vegetation and the surrounding landowners.	**MODERATE -**	In order to reduce the risk of fires: • All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances. • Smoking must not be permitted near flammable substances. • All cooking must be done in demarcated areas that are safe in terms of runaway or uncontrolled fires. • No open fires must be allowed on site. • Fire extinguishers must be available onsite.	**LOW -**
REHABILITATION AND MAINTENANCE					
Inadequate rehabilitation and maintenance	All Alternatives	During the operation phase inadequate rehabilitation of disturbed areas and lack of maintenance of infrastructure may lead to the degradation of the surrounding environment.	**MODERATE -**	Disturbed areas will be rehabilitated/prepared to allow natural re-vegetation.	**LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
TERRESTRIAL BIODIVERSITY AND ECOLOGY IMPACTS					
Disruption of Ecosystem Function and Processes	Preferred Alternative	Operational activities, such as routine maintenance, may result in the disruption of ecosystem functions and processes, including the disturbance of vegetation and faunal habitats, as well as edge disturbance impacts. Assuming the appropriate mitigation measures are adopted during the planning and design and construction phases, the severity of the operational phase impacts will be relatively low.	**LOW -**	Avoid/prevent impact: • Mitigation measures must be implemented during planning and design and construction phases. Minimize/reduce impact: • Monitoring and maintenance vehicles must not be permitted outside of the development footprint, as much as practically possible. Remediate/rehabilitate impact: • The rehabilitation plan must be implemented during operation phases.	**VERY LOW -**
		Portions of habitat have already been lost due to historical and current land uses occurring on site. The additional loss of habitats will have a low cumulative impact.	**LOW -**		**LOW-**
	No-go alternative	There is already a number of alien species which has established within the project area. Under the no-go alternative these species are likely to continue multiplying if left unchecked.	**LOW -**		**N/A**
Establishment and/or spread of Alien Plant Species	Preferred Alternative	During the operation phase, the failure to manage alien vegetation could result in the widespread invasion of alien vegetation.	**MODERATE -**	Avoid/prevent impact: • Mitigation measures must be implemented during planning and design and construction phases. Minimize/reduce impact: • The Alien Vegetation Management Plan must continue to be implemented. • The site must be monitored on a regular basis to ensure that no alien vegetation establishes on site. Remediate/rehabilitate impact: • Any alien vegetation found during monitoring must be removed as per the Alien Vegetation Management Plan and the area must be appropriately rehabilitated in alignment with the Rehabilitation Plan.	**VERY LOW -**
		Disturbance from the existing land uses will likely be exacerbated by the additional impacts of the operation of the proposed substation and powerlines. This will be of low significance.	**LOW -**		**VERY LOW -**
	No-go	Disturbance from the existing alien invasive species on site will probably continue should the proposed project not go ahead. This will have a moderate negative impact on the site.	**MODERATE -**		**N/A**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
RIVER AND WETLAND IMPACT					
Alteration of hydrological and geo-morphological processes	Preferred Alternative	During the operational phase, localised altered flow patterns may occur around the powerline pylons. This may indirectly result in increased run-off, erosion and sedimentation.	**LOW -**	Minimize/reduce impact: • All operational phase service roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads and dirt tracks should be used as maintenance roads if such access routes avoid watercourses. • Stormwater measures must be installed at pylon sites. • Stormwater infrastructure must be maintained and monitored for effectiveness with respect to controlling and minimising erosion and sedimentation of watercourses. Remediate/rehabilitate impact: • The site must be monitored for erosion and should be rehabilitated where applicable.	**VERY LOW -**
Ecological connectivity and edge disturbance impacts	Preferred Alternative	During the operational phase, inadequate rehabilitation of disturbed areas may lead to the reduction of ecological connectivity and degradation of the surrounding environment.	**LOW -**	Remediate/rehabilitate impact: • Disturbed areas should be rehabilitated and re-vegetated.	**VERY LOW -**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Water pollution impacts	Preferred Alternative	During the operational phase, routine maintenance may lead to the introduction of chemical / hazardous substances into the watercourse, soil and/or groundwater, adversely affecting the aquatic ecosystems in the broader area.	**LOW -**	Avoid/prevent impact: • No machinery must be parked overnight within 50m of the rivers/wetlands. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. • All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site. Remediate/rehabilitate impact: • Emergency plans must be in place in case of spillages onto bare soil or within water courses.	**VERY LOW -**
	No.go	Should the project not proceed then the current land use will remain the same. The site is highly degraded and current impacts are likely to persist.	**LOW -**	• No mitigation measures are proposed for the no-go alternative.	**LOW -**

11.4 DECOMMISSIONING PHASE IMPACTS

Table 11-4: Summary of impacts associated with the proposed 400 kV LILO Powerline during the decommissioning phase.

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
TERRESTRIAL BIODIVERSITY AND ECOLOGY IMPACTS					
Loss of Indigenous Vegetation	Preferred Alternatives	The decommissioning of the infrastructure and removal of materials will require laydown areas and will disrupt vegetation that has re-established around the areas that were disturbed during the construction phase. The loss of vegetation will be similar to the construction phase impacts.	**MODERATE -**	Avoid/prevent impact: • Mitigation measures must be implemented during planning and design phase. Minimize/reduce impact: • Decommissioning activities must remain within the approved demarcated development footprint, and no vegetation clearance is to be permitted outside of the approved development footprint. • Vehicles and machinery must not encroach into identified highly-sensitive, 'no-go' areas or areas outside the project footprint. • Lay down areas must not be located within any watercourses or drainage lines. Remediate/rehabilitate impact: • Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas). • Only indigenous species must be used for rehabilitation. • The alien invasive management plan for the site must be implemented.	**LOW -**
	No-go	Should the project not proceed then the current land use will remain the same. Vegetation will likely continue to degrade under current land uses.	**LOW -**		**N/A**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Disturbance to faunal species and potential reduction in abundance and mortality of faunal species	Preferred Alternative	Faunal species will be disturbed during decommissioning due to noise and vibrations of machinery. Faunal Species that vacate the immediate area may return following completion of construction or new individuals or species may inhabit the area. Machinery may cause unintentional mortalities of faunal species.	**LOW -**	Minimize/reduce impact: • Vehicles and machinery must meet best practice standards in terms of noise and vibration. • Staff and contractors' vehicles must comply with speed limits of 40 km/hr • Project must start and be completed within the minimum timeframe, i.e. may not be started and left incomplete. • ECO must walk ahead of machinery and move slow moving species e.g. tortoises out of harm's way and into suitable neighbouring habitat. • Any faunal species that may die as a result of decommissioning must be recorded (photographed, GPS coordinate captured) and if somewhat intact preserved and donated to SANBI. • Any faunal species observed onsite must be recorded (photographed, GPS coordinate captured) and loaded onto iNaturalist. • Staff and contractors must not permitted to capture, collect or eat any faunal species onsite.	**LOW -**
		Portions of habitat have already been lost due to historical and current land uses. The additional loss of habitats will have a low cumulative impact.	**LOW -**		**LOW -**
	No-go	Disturbance from the existing land uses will probably continue should the proposed project not go ahead. This will have a low negative impact on the site, with habitats continuing to degrade.	**LOW -**		**N/A**

12 SUMMARY OF KEY ENVIRONMENTAL FINDINGS

This section provides and overview of the environmental impacts associated with the proposed development. Table 12.1 provides an overall summary of the negative (cost) and positive (benefit) environmental impacts. Overall, the tables above indicates that there are several potential negative impacts (environmental costs) associated with the proposed LILO powerlines. The significance of most of these impacts can be reduced to an acceptable level by implementing appropriate mitigation measures.

There are a few positive impacts (benefits) associated with the proposed development. These relate primarily to the socio-economic aspects of the project, e.g. job creation, indirect economic benefits and the improvement in the energy supply. Based on the below analysis it can be seen that pre-mitigation, there is three negative impacts of HIGH significance, 42 of MODERATE significance, 21 of LOW significance and one of VERY LOW significance. After mitigation there are no negative residual impacts of HIGH or MODERATE significance, with 53 of LOW significance and 14 of VERY LOW significance.

Table 12.1: Summary of impacts before and after mitigation across phases.

IMPACTS	BEFORE MITIGATION				AFTER MITIGATION	
	VERY LOW	LOW	MOD	HIGH	VERY LOW	LOW
Policy and Legislation				-3		-3
Built Environment		(+1)	-9			-9 (+1)
Social		(+3)	-11			-11 (+3)
Rehabilitation			-3			-3
Agricultural		-1				-1
Archaeological		-4				-4
River and Wetland		-6	-1		-6	-1
Terrestrial Ecology	-1	-10	-18		-8	-21
Total	**-1**	**-21 (+4)**	**-42**	**-3**	**-14**	**-53 (+4)**

13 CONCLUSIONS AND RECOMMENDATIONS

This Chapter of the DRAFT BAR provides a summary of the findings of the proposed 400 kV LILO powerlines and a comparative assessment of the positive and negative implications of the proposed project and identified alternatives. In addition, this Chapter provides the EAP's opinion as to whether the activity should or should not be authorised as well as the reason(s) for the opinion.

13.1 DESCRIPTION OF THE PROPOSED ACTIVITY

Eskom Holdings SOC Ltd is proposing the development of a powerline to improve the transmission network supply in the Johannesburg East in the Gauteng Province, by erecting the following loop-in and loop-out 400kV lines:

- Approximately 2 x 1 km 400 kV line-loop-in and loop-out of the Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS).

13.2 ASSUMPTIONS, UNCERTAINTIES AND GAPS

13.2.1 ASSUMPTIONS

The following assumptions have been made during the BA process:

- Vegetation clearance will be kept to a minimum during the construction of the powerline.
- The report is based on a project description received from the client.
- Archaeological Assessment:
    - The site survey for the ESKOM Mesong 400kV Loop-In Loop-Out Project AIA primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the mapping and aerial survey) as well as areas of potential high human settlement catchment.
    - Access control is applied to the area but arrangements were made and no access restrictions onto the site were encountered during the site visit.
    - The surrounding vegetation in the project area mostly comprised out of occasional trees and mixed grasslands with pioneering species occurring in places and the general visibility at the time of the site inspection (July 2021) proved to be a minor constraint in the project area.
    - Cognisant of the constraints noted above, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

- River and Wetland Ecosystem Assessment:
    - Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development;
    - Sampling could only be carried out at one stage in the annual or seasonal cycle. The survey was conducted in late winter, outside of the flowering season of plant species. Seasonality influences the species of flora encountered at the site, with the flowering time of many species often posing a challenge in species identification. Since the wetland vegetation in the study area was largely monotypical and somewhat degraded, with low native plant diversity, seasonality would not be as significant a limitation when compared with a vegetation community that is largely natural or high in native plant diversity.
    - Although every effort was made to correctly identify the plant species encountered onsite, wetland plants, particularly the Cyperaceae (sedge) family, are notoriously difficult to identify to species level. Every effort as made to accurately identify plants species but where identification to species level could not be determined, such species were only identified to genus level.
    - The site survey for the River and Wetland Ecosystem Assessment (this report) was undertaken concurrently with that of the Terrestrial Ecological Assessment (CES, 2022). The delineation and characterisation of the on-site wetlands therefore relies largely on topographical and vegetation indicators, with a limited number of soil samples.
- Terrestrial Biodiversity Assessment:
    - A detailed faunal survey was not conducted. Although a site visit was undertaken, the faunal survey was mainly a desktop study, using information from previous ecological surveys conducted in the area. This data was supplemented by recording animal species that were observed during the site survey.
    - A separate avifaunal survey was undertaken by a specialist and birds are therefore not included in this report.
    - Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development.
    - Sampling could only be carried out at one stage in the annual or seasonal cycle. The survey was conducted in late winter, outside of the flowering season of plant species. However, the time available in the field, and information gathered during the survey was sufficient to provide enough information to determine the status of the affected area.

13.2.2 GAPS

No detailed engineering input was provided in this phase of the development. It is general engineering practice that the detailed design phase of a project is only initiated once environmental authorisation for a project (based on what is submitted as preliminary design) is secured. In this regard, the BAR

considered industrial norms. This has also provided the EIA process an opportunity to guide the Planning and Design proactively rather than reactively. The Environmental Management Programme (EMPr) should therefore be viewed as a dynamic evolving document that can be adapted to specific needs and design conditions.

If the project is authorised by National Department of Forestry, Fisheries and Environment (DFFE), Eskom Holdings SOC Ltd will be required to provide DFFE with final layout plans (i.e. panel placement, panel designs, etc.). These plans should be informed by the BA and any other post-authorization studies or surveys as required, e.g. geotechnical investigations, ecological walk-throughs and micro siting adjustments. The final layout requirement will further serve to demonstrate to DFFE how the relevant environmental standards and management specifications contained in the EMPr, as informed by the site specific environmental context and potential impacts, as well as the relevant conditions of authorisation, will be incorporated in the detailed design process.

13.3 CONSIDERATION OF ALTERNATIVES

13.3.1 LOCATION AND LAYOUT ALTERNATIVES

Only one location (corridor), with one layout has been assessed (Figure 2.1). The proposed route for the LILO is the most direct and avoids having to navigate through the surrounding urban areas. Therefore, only the project corridor and layout as described in this report has been considered.

13.3.2 TECHNOLOGY ALTERNATIVES

Only the development of a 400 kV LILO strung on steel lattice pylon structures is considered.

13.3.3 ACTIVITY ALTERNATIVES

The project involves the development of 2 x 1 km 400 kV line- loop-in and loop-out (LILO) powerlines. Alternative activities for the current project are not reasonable or feasible as the purpose of the proposed LILO is to connect the existing Apollo-Croydon 275 kV line into Mesong Main Transmission Station (MTS).

13.3.4 NO-GO ALTERNATIVE

The “No-go” alternative entails maintaining the status quo. In other words, the proposed construction of the 400 kV LILO would not go ahead, and current land uses would continue as before. While potential risks associated with the new 400 kV LILO would be avoided, the existing impacts of existing electrical infrastructure (i.e. existing powerline and switching station) would persist and, potential benefits of the proposed project would be forfeited.

13.4 OPINION OF THE EAP

It is the professional opinion of CES and specialists that:

- **NO FATAL FLAWS** are currently associated with the proposed Overhead line installation as all identified impacts can be adequately mitigated to reduce the risk or significance of impacts to an acceptable level, provided mitigation measures recommended in this report are implemented and maintained throughout the life of the project.

- If any changes to these layouts are made, the input of the relevant specialist must be obtained and incorporated into any changes.
- The information in the report is sufficient to allow DFFE to make an informed decision.

13.5 RECOMMENDATION OF THE EAP AND SPECIALIST

It is the recommendation of CES that the proposed powerline at Eskom Mesong should be approved provided that the proposed mitigation measures are implemented and that the EMPr is implemented, maintained and adapted to incorporate relevant legislation, standard requirements and audit reporting, throughout the life of the development. The mitigation measures for all impacts identified in the BAR must be incorporated into the EMPr and must be used by the engineers during the detailed Planning & Design Phase, by the contractors during the Construction Phase and by Eskom Holdings SOC Ltd during the Operation Phase. The following recommendations and concluding remarks are provided by the specialists.

13.5.1 AGRICULTURAL

From an agricultural impact point of view, it is recommended that the development be approved. Given the above, the protocol requirement of confirmation that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities, is not relevant in this case. For the same reasons, there are no Environmental Management Programme inputs required for the protection of agricultural potential on the site.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions. In completing this statement, no assumptions have been made and there are no uncertainties or gaps in knowledge or data that are relevant to it. No further agricultural assessment of any kind is required for this application.

13.5.2 ARCHAOELOGICAL

During the survey, no heritage receptors were noted in the project footprint and it might be assumed that this site is favourable for development. This inference is made on the assumption that no previously-undetected heritage remains are encountered during pre-construction vegetation clearing, earth moving activities and construction. The following general recommendations are made based on general observations in the proposed Eskom Mesong 400kV Loop-In Loop-Out Project in terms of heritage resources management:

- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.
- It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the project area along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and

historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

13.5.3 RIVER AND WETLAND

13.5.3.1 Water Use Licensing

The proposed development site falls within 100 m of watercourses and within 500 m of artificial wetlands, and will therefore require a WUA under Section 21(c) and 21(i) of the NWA. Under Section 21 of the NWA, the proposed development would require either a General Authorisation (GA) or full Water Use Licence (WULA) (depending on the level of risk) for any development occurring within 500m of a wetland, due to the triggering of the following water uses:

- 21(c) impeding or diverting the flow of water in a watercourse (relevant to the construction occurring in close proximity to drainage lines); and
- 21(i) altering the bed, banks, course or characteristics of a watercourse (relevant to the construction occurring in close proximity to drainage lines).

The level of risk associated with the water use activities has been assessed using the DWS Risk Assessment Matrix. Since the proposed development was found to carry a low risk, a GA will be required for these water uses.

13.5.3.2 Recommendations

All the mitigation measures provided below are to be implemented in the Planning and Design, Construction and Operation Phases of the proposed activity.

Planning and design phase:

- All legal matters pertaining to permitting must be completed prior to any construction activity.
- In particular, all necessary Water Use Authorisations must be in order for the abstraction and storage of water, as well as any construction activities within 500 m of a wetland.
- An Erosion and Stormwater Management Plan should be developed during the planning and design phase and implemented during the construction and operational phases.
- Appropriate stormwater structures must be designed to control run-off and minimize erosion.
- Wherever possible, construction activities should be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.
- All construction phase access and haulage roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads and dirt tracks should be used to access the construction sites if such access routes avoid watercourses.
- All operational phase service roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads and dirt tracks should be used as maintenance roads if such access routes avoid watercourses.

Construction phase:

- Construction materials must not be stored within the moderate sensitivity areas.

- Stockpiles must not be stored within the moderate sensitivity areas.
- No concrete mixing must take place within any watercourse.
- No machinery must be parked overnight within 50 m of the rivers/wetlands.
- All stationary machinery must be equipped with a drip tray to retain any oil leaks.
- Chemicals used for construction must be stored safely on bunded surfaces in the construction site camp.
- No ablution facilities must be located within 50 m of any river or wetland system.
- Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.
- Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.
- All general waste and refuse must be removed from site and disposed and windproof temporary storage area before being disposed of at a registered landfill site.
- Construction activities should be undertaken during the driest part of the year to minimize erosion and downstream sedimentation due to excavation, etc.
- Appropriate stormwater structures must be implemented during construction to control run-off and minimize erosion.
- Vegetation clearing must be kept a minimum and only to the site footprint.
- Erosion controls and sediment trapping measures must be put in place.
- Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses.
- Stockpiles must not exceed 1.5m in height. Stockpiles must be covered during windy periods.
- Disturbed areas must be monitored for erosion channels and these must be rehabilitated.
- All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.
- Emergency plans must be in place in case of spillages onto bare soil or within water courses.
- All construction phase access and haulage roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads and dirt tracks should be used to access the construction sites if such access routes avoid watercourses.

Operational phase:

- Stormwater infrastructure must be maintained and monitored for effectiveness with respect to controlling and minimising erosion and sedimentation of watercourses.
- The site must be monitored for erosion and should be rehabilitated where applicable.
- Disturbed areas should be rehabilitated and re-vegetated.
- All operational phase service roads must avoid the delineated watercourses and buffer zones. As far as practically possible, existing roads.

13.5.4 TERRESTRIAL BIODIVERSITY

As per Section 3.2 of the Terrestrial Biodiversity Protocol (2020), *"the findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant."* All mitigation measures should

therefore be incorportated in the Basic Assessment Report and EMPr once the applicant proceeds to apply for Environmental Authorisation. It should be noted that if the impacts are suitably planned for and mitigated (i.e. avoided or minimized) during the planning and design phase, the impacts of these will be reduced during the construction phase, even in the absence of active mitigation during construction. Similarly, if the impacts are suitably planned for during the planning and design phase, and mitigated and rehabilitated during the construction phase, the operational phase impacts will also be significantly reduced, even in the absence of active mitigation during the operational phase. That said, it is recommended that all mitigation measures are implemented during all phases.

It is recommended that a separate Avifaunal Specialist Assessment be completed for the HIGH sensitivity bird species.

All the mitigation measures provided below are to be implemented in the Planning and Design, Construction, Operational and Decommissioning Phases of the proposed activity.

Planning and design phase:

- Avoid/prevent impact:
  - Planning for any search and rescue operations must be conducted prior to the commencement of construction activities.
  - All necessary permits must be obtained for the removal of any identified SCC prior to the commencement of construction activities.

- Minimize/reduce impact:
  - During the planning and design phase, the development footprint must be designed to minimize the loss of near- to semi-natural indigenous vegetation as far as possible.
  - The development footprint must be clearly demarcated and only vegetation within the approved footprint may be removed. Vegetation outside of these areas may not be cleared.
  - During the planning and design phase, the development footprint must be designed to minimize edge disturbance impacts.

- Remediate/rehabilitate impact:
  - A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.
  - An Alien Vegetation Management Plan must be developed by the Contractor prior to construction to mitigate the establishment and spread of undesirable alien plant species during all phases of the project.
  - The Alien Vegetation Management Plan must be approved by the appointed ECO prior to implementation.

Construction phase:

- Avoid/prevent impact:
  - Mitigation measures must be implemented during planning and design phase.

- Areas of VERY HIGH sensitivity must be avoided.
- A botanical walkthrough of the development area, by an experienced botanist with knowledge of the SCC identified as possibly occurring within the site, must be undertaken during the flowering season.
- If restricted range SCC populations are found, the development must be shifted to avoid these populations.
- The ECO must monitor for potential additional plant SCCs not found during search and rescue activities.
- Plant SCCs must not be removed from the development footprint unless the relevant permits have been obtained.
- All clearing activities must deploy search and rescue teams in-front of clearing machinery to assist in relocating slower moving faunal species e.g. tortoises.
- This team should focus on checking termite mounds, burrows and dens in particular for small mammals, such as the Black-footed Cat, Southern African Hedgehog, shrews and rats.

- Minimize/reduce impact:
  - Construction activities must remain within the approved demarcated development footprint, and no vegetation clearance is to be permitted outside of the approved development footprint.
  - Construction vehicles and machinery must not encroach into identified highly-sensitive, 'no-go' areas or areas outside the project footprint.
  - Activities within 500 m of a wetland must obtain the necessary Water Use Authorisation prior to the commencement of such activities.
  - Lay down areas must not be located within any watercourses or drainage lines.
  - The contractor must ensure that vegetation clearance of near-natural, semi-natural and wetland vegetation is restricted to the approved development footprint only.
  - Construction vehicles and machinery must not be permitted outside of the development footprint, as much as practically possible.
  - Clearing of trees should take place in winter months, to prevent birds and bats establishing nesting grounds and starting to breed and rear young in the spring and summer months.
  - Employees must be prohibited from making open fires during the construction phase.
  - The ECO must monitor that all construction activities are conducted within the development footprint.
  - Vehicles and machinery must meet best practice standards in terms of noise and vibration.
  - Staff and contractors' vehicles must comply with speed limits of 40 km/hr
  - Project must start and be completed within the minimum timeframe, i.e. may not be started and left incomplete.
  - ECO must walk ahead of clearing construction machinery and move slow moving species e.g. tortoises out of harm's way and into suitable neighbouring habitat.
  - Any faunal species that may die as a result of construction must be recorded (photographed, GPS coordinate captured) and if somewhat intact preserved and donated to SANBI.
  - Any faunal species observed onsite must be recorded (photographed, GPS coordinate captured) and loaded onto iNaturalist.
  - Staff and contractors must not be permitted to capture, collect or eat any faunal species onsite.
  - The Contractor must implement the Alien Vegetation Management Plan. The ECO must monitor for the adequate implementation of this plan.

- The ECO must monitor the site for the presence of alien invasive plant species and take immediate action when these are recorded.
- It is recommended that the ECO prepare a photo guide of all invasive plant species likely to occur on site. This will aid in the identification of undesirable species.

- Remediate/rehabilitate impact:
  - Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).
  - Only indigenous species must be used for rehabilitation.
  - The alien invasive management plan for the site must be implemented.
  - All impacted areas must be rehabilitated as per the Rehabilitation Plan, as soon as construction has been completed within each area.
  - All trenches/excavations must be backfilled and all disturbed areas backfilled, compacted and revegetated, where applicable.
  - All previously infested areas must be rehabilitated as per the Rehabilitation Plan, to the satisfaction of the appointed ECO, as soon as construction has been completed within each area.

Operational phase:

- Minimize/reduce impact:
  - Monitoring and maintenance vehicles must not be permitted outside of the development footprint.
  - The Alien Vegetation Management Plan must continue to be implemented.
  - The site must be monitored on a regular basis post-construction to ensure that no alien vegetation establishes on site.

- Remediate/rehabilitate impact:
  - The rehabilitation plan must be implemented during operation phases.
  - Any alien vegetation found during monitoring must be removed as per the Alien Vegetation Management Plan and the area must be appropriately rehabilitated in alignment with the Rehabilitation Plan.

Decommissioning phase:

- Minimize/reduce impact:
  - Decommissioning activities must remain within the approved demarcated development footprint, and no vegetation clearance is to be permitted outside of the approved development footprint.
  - Vehicles and machinery must not encroach into identified highly-sensitive, 'no-go' areas or areas outside the project footprint.
  - Lay down areas must not be located within any watercourses or drainage lines.
  - Vehicles and machinery must meet best practice standards in terms of noise and vibration.
  - Staff and contractors' vehicles must comply with speed limits of 40 km/hr

- Project must start and be completed within the minimum timeframe, i.e. may not be started and left incomplete.
- ECO must walk ahead of machinery and move slow moving species e.g. tortoises out of harm's way and into suitable neighbouring habitat.
- Any faunal species that may die as a result of decommissioning must be recorded (photographed, GPS coordinate captured) and if somewhat intact preserved and donated to SANBI.
- Any faunal species observed onsite must be recorded (photographed, GPS coordinate captured) and loaded onto iNaturalist.
- Staff and contractors must not be permitted to capture, collect or eat any faunal species onsite.

- Remediate/rehabilitate impact:
  - Topsoil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).
  - Only indigenous species must be used for rehabilitation.
  - The alien invasive management plan for the site must be implemented.
  - All areas previously infested by alien plant species must be rehabilitated as per the Rehabilitation Plan, to the satisfaction of the appointed ECO, as soon as construction has been completed within each area.

14 APPENDICES

APPENDIX A – MAPS AND PHOTOGRAPHS
APPENDIX B – IMPACT TABLES
APPENDIX C – SPECIALIST IMPACT ASSESSMENT
APPENDIX D – PUBLIC PARTICIPATION PROCESS
APPENDIX E – ENVIRONMENTAL MANAGEMENT PROGRAMME
APPENDIX F – DETAILS AND EXPERIENCE OF THE EAP