BASIC ASSESSMENT PROCESS

for

THE PROPOSED CONSTRUCTION OF THE DUMA TELECOMMUNICATION RADIO TOWER WITHIN MTHONJANENI LOCAL MUNICIPALITY, KWAZULU-NATAL

DRAFT BASIC ASSESSMENT REPORT

Public Review

23 June 2023 to 24 July 2023

COMPILED BY:
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PROJECT DETAILS

DFFE Reference No.	**:**	Not assigned as yet
Title	**:**	Basic Assessment Process for the Proposed Construction of the **Duma Telecommunication Radio Tower** within Mthonjaneni Local Municipality, Kwazulu-Natal Province
Report compiled by	:	**Envirolution Consulting** Contact person: Ms Sheila Bolingo Postal Address: P.O. Box 1898, Sunninghill, 2157 Telephone Number: 0861 44 44 99 Fax Number: 0861 62 62 22 Email: sheila@envirolution.co.za
Client		**Eskom Holdings SOC Ltd**
Status	**:**	Draft Basic Assessment Report
Review period	**:**	The 30-day period for review is from **23 June 2023 to 24 July 2023**
Approved By:		Gesan Govender

TABLE OF CONTENTS

- Appendix D2: Proof of newspaper advertisements
- Appendix D3: Written Notifications
- Appendix D4: Previous Correspondences with I&APs
- Appendix D5: Comments from I&APs on Draft Report
- Appendix D6: Minutes of meetings
- Appendix D7: Comments and Responses Report
- Appendix D8: List of registered I&APs

Appendix E: Specialist reports

- Appendix E1: Aquatic and Wetland Impact Assessment
- Appendix E2: Terrestrial Ecological Impact Assessment
- Appendix E3: Avifauna Impact Assessment
- Appendix E4: Heritage Impact Assessment
- Appendix E5: Palaeontological (Desk-Top) Impact Assessment:
- Appendix E6: Visual Impact Assessment
- Appendix E7: Agriculture Potential Assessment

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Additional Information

- Appendix G1: Details of EAP (and expertise) and affirmation
- Appendix G2: Specialist's declaration of interest
- Appendix G3: Screening Report

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and Environment
DoE	Department of Energy
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance & Sensitivity
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP's	Integrated Development Plans
Km	Kilometres
Kv	kilovolts
KZN	KwaZulu-Natal
KZN EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
m	Meters
MW	Megawatts
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
PES	Present Ecological State
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
ZMVE	Zone of Maximum Visual Exposure

EXECUTIVE SUMMARY

INTRODUCTION

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high-quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa. The increase in demand for South Africa's high-quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings SOC Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations.

In order to address this request, various projects were proposed including the Construction of Nzalo and Duma 400kV Main Transmission Stations and the associated 88kV and 400kV Turn in Powerlines in Kwazulu Natal Province. TAP was responsible for managing Transnet's projects and this included appointment and management of Environmental Impact Assessment consultant (Sivest). The project was handed over to Land Development after EA has been secured, land acquisition process has been completed. However, the EIA listed activity dealing with radio tower within the approved Duma Substation was not included in the Environmental Authorisation (EA) process. In order to connect radio towers within substations, it is necessary to establish new Telecommunication towers. Transnet Project Overview as shown in **Figure 1:**

- 3 x New Transmission Main Transmission Substations (MTSs) (Madlanziniin Mpumalanga, Nzaloand Duma in KZN) received Environmental Authorisationsin 2015.
- Eskom Telecoms required to provide communication services for the three MTSs.
- 4 x New Radio Sites required:
- Two new Greenfield sites for Duma Ss; and
- Louwsbergand Paulpietersbergsites for NzaloSs.
- Duma RS (within approved Duma Substation footprint)
- Upgrade 2 x Existing RSs

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Duma Substation which is positioned 28 27 19.92 S and 31 42 20.83 E is a new substation to be built by Transmission in order to strengthen the TX grid so that Eskom can provide services to Transnet. In order for Eskom to necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. The **mast will be situated with the approved within approved Duma 400kV Main Transmission Station** located within Mthonjaneni Local Municipality, Kwazulu-Natal (**Figure 2**). The Mast will be approximately. 85m in height requiring a foot print of 16m X16m inside the Substation.

Eskom Holdings SOC Ltd (Transmission and Distribution) received approval for the construction of a 400/88 kV, 160MVA electrical Substation and associated 400kV and 88kV turn-in power lines connecting to the existing Athene Pegasus 400kV power line and Umfolozi Empangeni 88kV traction power line respectively, located 20km south-east of the town of Ulundi, KwaZulu-Natal, on the 07 October 2015 (14/12/16/3/3/1/1160) (**Figure 3).**

The EIA listed activity dealing with radio tower within the approved Duma Substation was not included in the Environmental Authorisation (EA) process. In order to connect radio towers within substations, it is necessary to establish new Telecommunication towers. The exclusion of listed activity in terms of EIA Regulations, 2014 (as amended) necessitates a new Basic Assessment Processes to be undertaken for the approval of the radio tower.

REQUIREMENT FOR A BASIC ASSESSMENT PROCESSNTRODUCTION

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

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

competent authority with sufficient information in order to make an informed decision.

As the applicant for the project is Eskom Holdings SOC Ltd which is a State-Owned-Company (SOC), therefore the National Department of Forestry Fisheries and Environment (DFFE) is the competent authority and the KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZNEDTEA) will act as a commenting authority. Eskom has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the BA process and compile the BA Report and Environmental Management Programme (EMPr). Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

PROJECT NEED AND DESIRABILITY

The proposed telecommunication mast is required to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. The proposed mast installation project will align with Eskom's objectives to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Eskom Holdings SOC Ltd considers this area to be highly preferred for the development for the following reasons:
This spot is required because it best suits the needs to integrate back into the Eskom telecommunication's network. In order for Eskom to necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

The mast will be situated with the approved within approved Duma 400kV Main Transmission Substation, and as the Mast will be situated within the Duma site, no alternative site locations have been investigated during the basic assessment process. Of the potential impacts only, the visual impact has been assessed in detail as it believed that there would be no other significant impacts as a result of the location of the mast. The visual impact associated with the mast was shown to be confined to the Duma substation area with minimal impact on the surrounding environment. The proposed mast therefore found to be acceptable as the potential impact can be mitigated to an acceptable level.

The proposed project is part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade. These suits of projects will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue. The Mthonjaneni Local Municipality which have high levels of unemployment and this project may provide a much-required capital injection to the area, along with a number of job opportunities during the construction and operational phases.

CONCLUSION (IMPACT STATEMENT)

As summarised in Table 9, it's been noted that the majority of the negative impacts associated with the construction of the proposed Duma Telecommunication Radio Tower are short-term (i.e. during the construction phase), majority of the negative impacts identified can be mitigated to low significance if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix F. The most significant impact flagged is the tower collision mortality risk posed to threatened bird species, that occur in higher-than-normal densities in the area due to the proximity of the site to important conservation areas and ecological corridors. The following mitigations are proposed in order to reduce the risk i) utilising the proposed Greenfields paired tower options NGF2 and VGF1 where the proposed tower height is 60 m and 70m, which is not particularly tall, and ii) the proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. However according to Eskom, they have moved away from this type as it is very difficult to maintain during its lifetime. According to the Eskom technical team, they currently don't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. We have also found that Lattice structures are more robust and durable for our network needs

Environmental constraints as listed on section 8.3 and shown in the environmental sensitivity map (Figure 27) includes are features that could be avoided during the detail design phase of the project, by careful placing of tower footprint. Owing to the fact that the project is for the provision of the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards, most of the impacts resulting from the project aspects are anticipated to be positive more so in the long-term of the implementation of the project, these benefits of the project are expected to occur beyond the local area therefore the benefits partially offset the localised environmental costs of the project.

The findings this report indicate that there are no significant environmental fatal flaws associated with the proposed development, the majority of the negative impacts associated with the project are minor, the positive impacts outweigh the negatives considerably and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable. Responsible environmental management will be required on site, during the planning and construction phases of the project. It is therefore the opinion of the EAP that the proposed development could proceed as all impacts identified are localised and manageable provided that the mitigation measures set out in this report (refer to section 8.5) and in the EMPr (Appendix F) are diligently implemented to limit the potential impacts on sensitive ecological and visual aspects of the project during construction and operation of the development.

RECOMMENDATIONS

- The EAP **recommends** that the **construction of the proposed Duma Telecommunication Radio Tower be authorised**. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation, specialist report recommendations and all other relevant environmental legislation. The following relevant **conditions would be required** to be included within an authorisation issued for the project.
- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- The following mitigation measures to reduce the occurrence of bird collisions with towers must be adhered to:
- Utilising the proposed Greenfields paired tower options NGF2 and VGF1 where the proposed tower height is 60m and 70m respectively,
- the proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. Threatened and Protected Plant Search and Rescue: Prior to construction commencing, the following must be undertaken:
- The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads*, including *Ceropegia crassifolia*.
- Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented.
- Stormwater Management Plan is established for the Service Road. All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.
- Demarcation of 'No-Go' areas and construction corridors
- Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- The developer should obtain all necessary permits prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species.

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INVITATION TO COMMENT ON THE DRAFT BA REPORT

A draft Basic Assessment Report (DBAR) was released for public review in June 2021 for a 30-day public review period. , Ezemvelo Wildflife raised some Issues & concerns that the applications (1) have severe impacts on important biodiversity features (of particular concern are threatened vulture species and other avifaunal species) and Protected Areas, (2) the inadequacy of the Visual Impact Assessments, and (3) a recommended that the use of existing tower sites be investigated (See **Appendix E4** for the full correspondences).

The current Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to i) address issues and concerns previously raised by Ezemvelo and to assess the potential environmental impacts associated with the proposed construction of the **Duma Telecommunication Radio Tower**. The report is again made available for public review for 30-day review period from **23 June 2023 to 24 July 2023** at the following place:

Melmoth Library
21 Reinhold Street,
Melmoth,
3835

In order to obtain further information or submit written comments please contact:

Environmental Assessment Practitioner

Name:	Sheila Bolingo
Physical Address:	Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
Postal Address:	PO Box 1898, Sunninghill, 2157
Telephone Number:	(0861) 44 44 99
Fax Number:	(0861) 62 62 22
E-mail:	sheila@envirolution.co.za

The due date for comments on the Draft Basic Assessment Report is Monday, 24 July 2023.

1 INTRODUCTION

1.1 Project Background

The proposed construction of Duma Telecommunication Radio Tower within the Mthonjaneni Local Municipality is part of a suite of projects collectively known as the Transnet Coal Link Upgrade.

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high-quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa. The increase in demand for South Africa's high-quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings SOC Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations.

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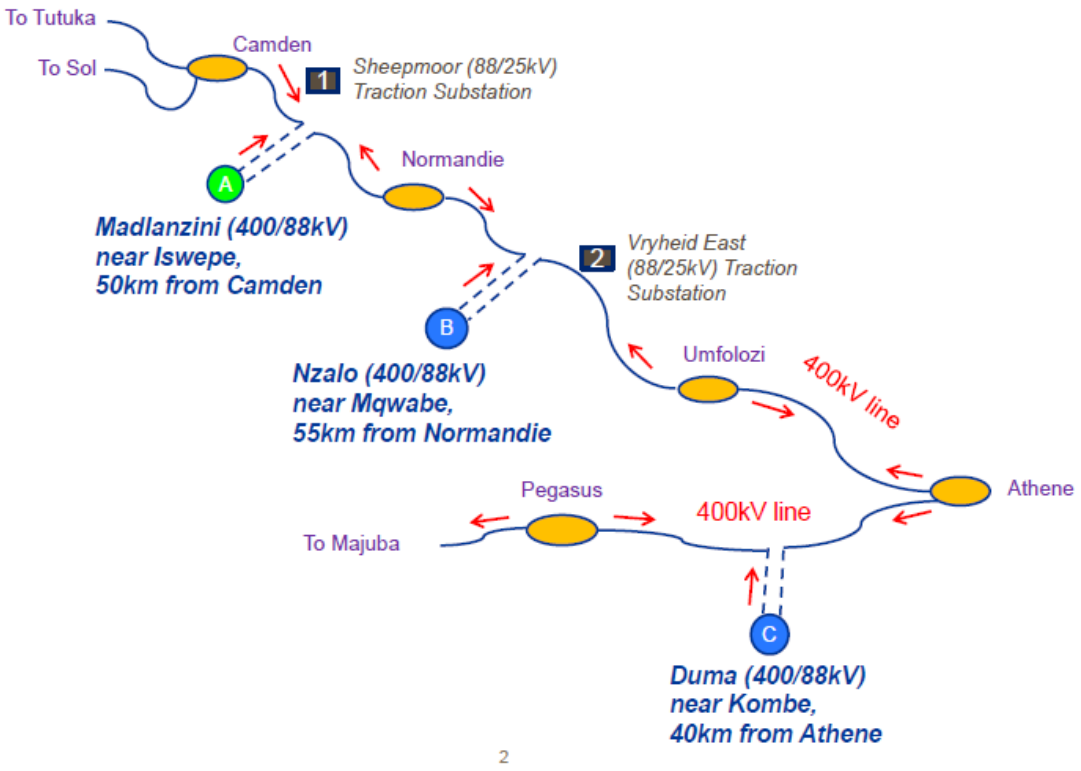

Figure 1: Transnet Project Overview

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Duma Substation which is positioned 28 27 19.92 S and 31 42 20.83 E is a new substation to be built by Transmission in order to strengthen the TX grid so that Eskom can provide services to Transnet. In order for Eskom to provide the necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. The **mast will be situated with the approved within approved Duma 400kV Main Transmission Station** located within Mthonjaneni Local Municipality, Kwazulu-Natal (**Figure 2**). The Mast will be approximately. 85m in height requiring a foot print of 16m X16m inside the Substation.

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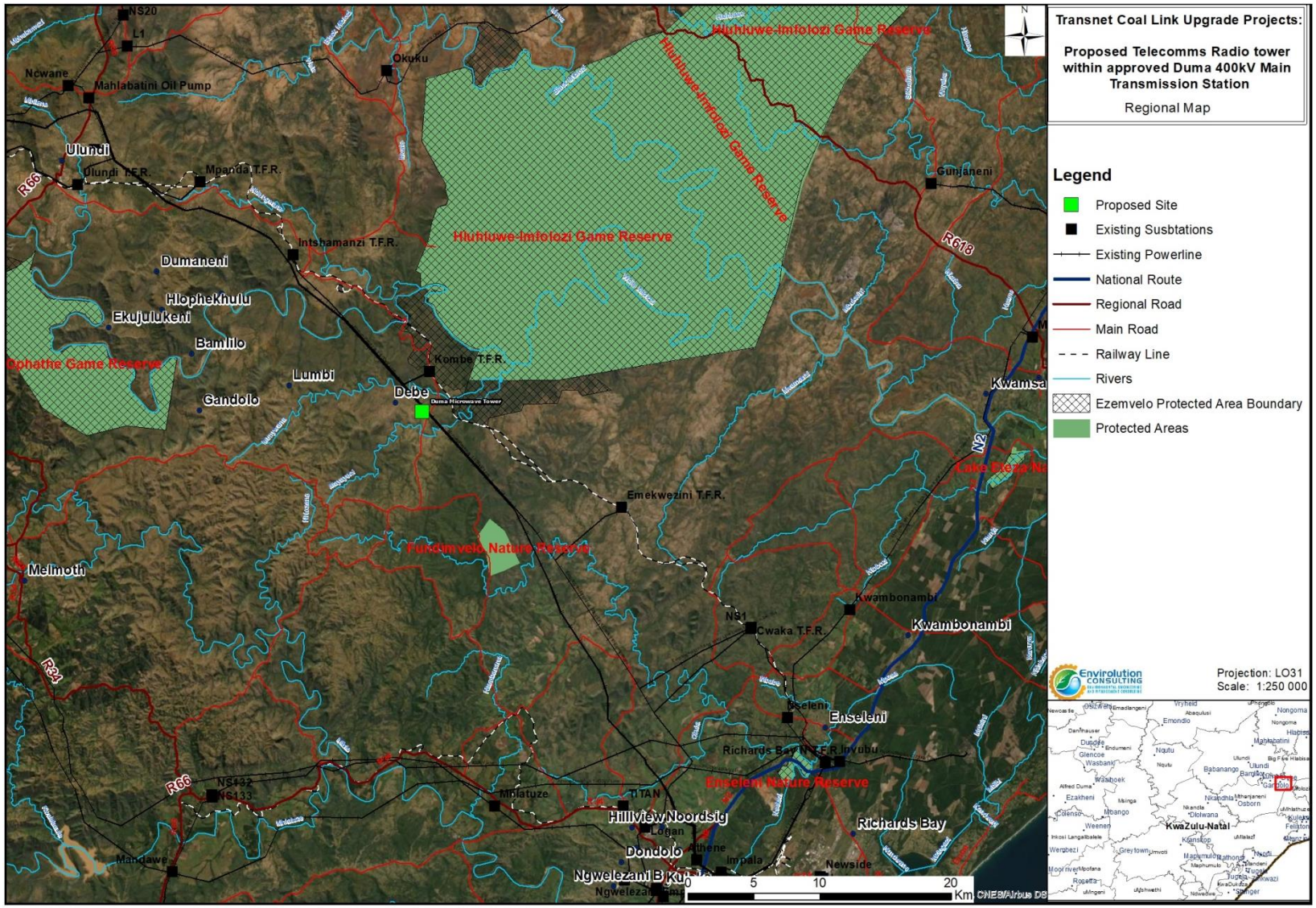

Figure 2: Locality map showing the proposed Duma Telecommunication Radio Tower

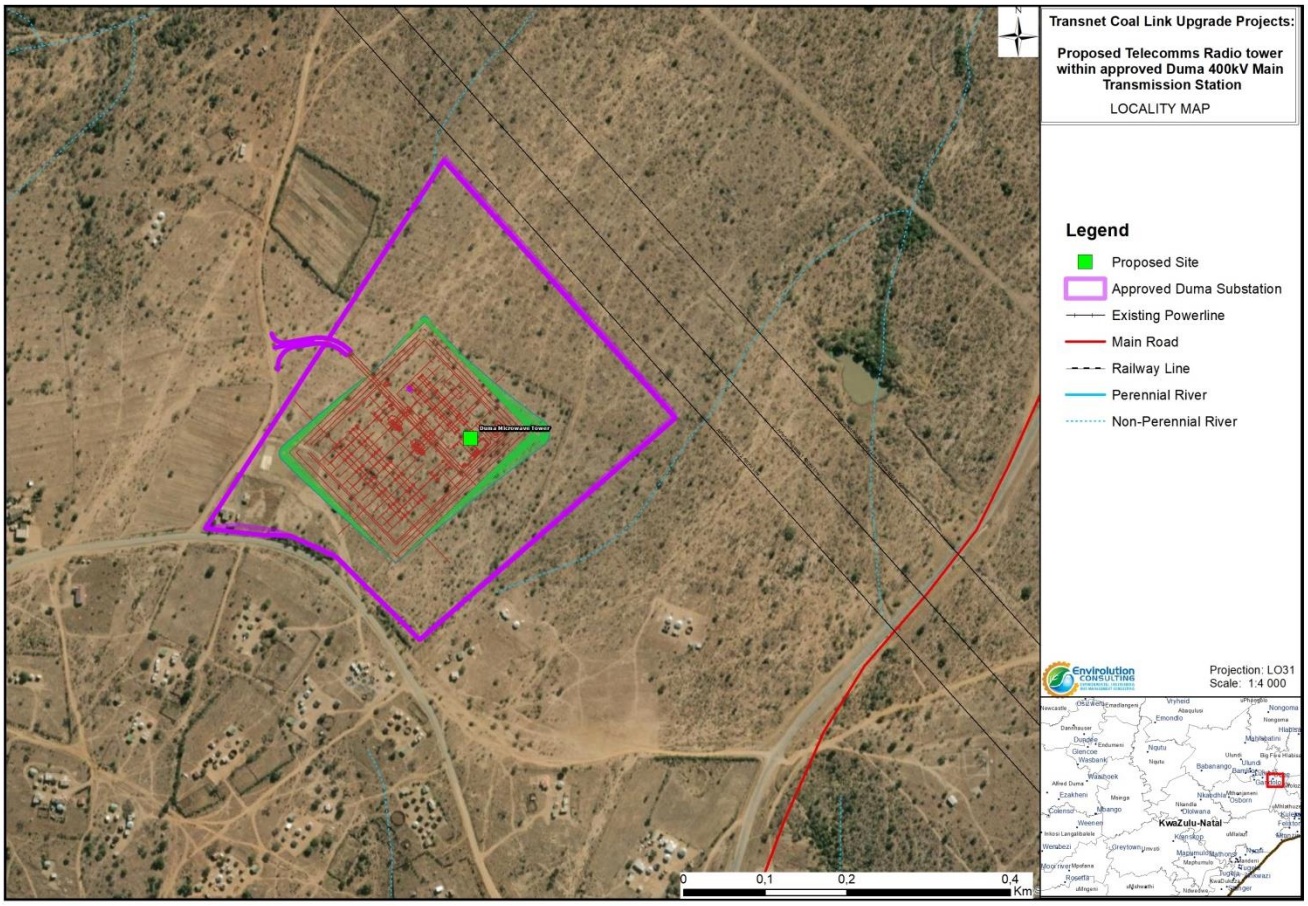

Figure 3: Locality Map showing the previously authorised project.

1.2 Requirement for a Basic Assessment Process

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

An environmental impact assessment is an effective planning and decision-making tool for the applicant as it provides the opportunity for the applicant to be fore-warned of potential environmental issues and assess if potential environmental impacts need to be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process includes certain feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided to an acceptable level as confirmed

by the Environmental Assessment Practitioner (EAP). Comprehensive, independent environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the EAP of its comprehensive recommendation and provide the competent authority with sufficient information in order to make an informed decision.

As the applicant for the project is Eskom Holdings SOC Ltd which is a State-Owned-Company (SOC), therefore the National Department of Forestry Fisheries and Environment (DFFE) is the competent authority and the KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZNEDTEA) will act as a commenting authority. Eskom has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the BA process and compile the BA Report and Environmental Management Programme (EMPr). Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

1.3 Project Team

Envirolution Consulting (Pty) Ltd was contracted by Eskom Holdings SOC Ltd as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to Eskom Holdings SOC Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

I. APPLICANT DETAILS

Name of applicant:	Eskom Holdings SOC Ltd
Applicant representative:	Tobile Bokwe
Position:	Programme Manager: Land Development
Contact number/s:	011 800 2303
Physical address:	Transmission Division Grid Planning & Development Megawatt Park D1X37 Maxwell Drive Sunninghill Sandton
E-mail:	bokwett@eskom.co.za

II. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)'s DETAILS

Environmental Assessment Practitioner (EAP):	Karthigesan Govender		
Contact person:	Sheila Bolingo		
Postal address:	PO Box 1898, Sunninghill		
Postal code:	2157		
Telephone:	087 898 5000	Cell:	083 419 8905
E-mail:	sheila@envirolution.co.za; gesan@envirolution.co.za	Fax:	(086) 162 62 22
EAP Qualifications	BSc (Hons) in Botany		
EAP Registrations/ Associations	Registered with the South African Council for Natural Scientific Professions (No: 400049/12)		

Details of the EAP's expertise to carry out Basic Assessment procedures

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix G1** for CVs):

Sheila Bolingo– The Environmental Assessment Practitioner (EAP) for this project holds an Msc degree in Environmental Management with 12 years of experience in the consulting field and is EAPASA registered. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.

Karthigesan Govender – The Project Manager for this project is a registered Professional Natural Scientist and holds an Honours Degree in Botany. He has over 18 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIAs for several diverse projects across the country.

III. SPECIALIST DETAILS

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialists to conduct specialist impact assessments:

- Aquatic and wetland impact assessment – Ryan Edwards of Verdant Environmental
- Terrestrial ecological –Ryan Edwards & team of Verdant Environmental
- Avifauna - David Allan & Robyn Phillips of Cossypha Ecological
- Heritage - Johan van Schalkwyk of Johan Heritage Consultant
- Palaeontology - Heidi Fourie
- Visual – Mader van den Berg of Skets
- Agricultural Potential – Joshua Oluokun of Environet Consulting

Specialist declarations are included in **Appendix G2**

2 PROJECT DESCRIPTION

2.1 Project Location

The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. In order for Eskom to provide the necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity.

The proposed Tower will be situated with the approved within approved Duma 400kV Main Transmission Station located approx. 35km south east of Ulundi within the Mthonjaneni Local Municipality (Ward 13) in the King Cetshwayo District of Kwazulu-Natal. Duma Substation which is positioned 28 27 19.92 S and 31 42 20.83 E is a new substation to be built by Transmission in order to strengthen the TX grid so that Eskom can provide services to Transnet

The proposed mast will be located on the following property:

- Portion 4 Reserve No 11 15831 GU
- SGID: N0GU00000001583100004

At the following coordinates:
Lat: 28°27'19.97"S
Long: 31°42'19.79"E

Figure 4 illustrates the project location. Access to the site is to comprise a single-lane gravel access road; this will be approximately 200m long and turn off north from the gravel road that leads to the settlement of Debe. Access to the site will be as per Duma substation requirements.

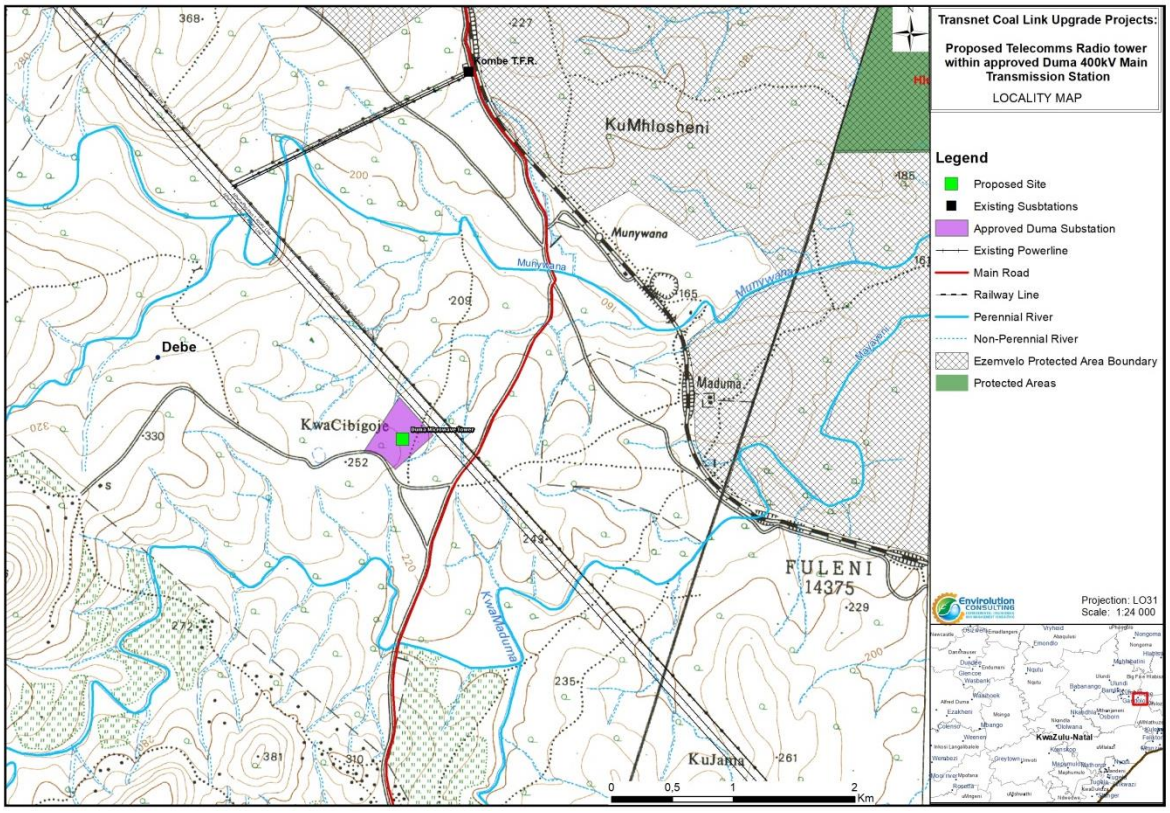

Figure 4: Locality Map (within approved Duma 400kV Main Transmission Station)

2.2 Technical Details

The proposed tower development entails the following:

- The erection of an approximately 85m Telecommunications tower Mast in height
- Tower of 16m X16m foot print inside the Substation complex
- Fenced off as per the current Eskom specification at time of build.
- There will either be a brick building or container built on site as per Eskom requirements to house the indoor equipment.
- The mast will conform to the Substation requirements since tower will be built inside the substation area.

2.3 Alternatives Description

2.3.1 Site Alternatives

An intensive investigation was carried out by Telecomms planning engineer together with a qualified land surveyor over a period of 18 months. Sites visits were done to verify any man-made physical structures and the actual terrain on sites as shown in **Figure 5**. Even though there were other sites in the vicinity most of them could not offer solution because of the obstructed LOS since the link path profile design requires a clear line of sight between the two ends of a microwave link for it to be successful.

It was for this reason that only those proposed sites were deemed to give the working solution. It is NOT the requirement to be on top of a hill to provide area coverage (as is the case for Cell Phone towers). These links are point to point and will NOT work from a location other than that it is designed at, hence they cannot be moved at will. The establishment of new sites is always a last resort as it is both costly and will entail further environmental disturbances, which we try to avoid. In addition to the above, the Duma Substation has received in 2015 therefore the proposed Duma RS is within approved Duma substation site.

For the above reasons **only one feasible site** is proposed for the Duma Telecomms.

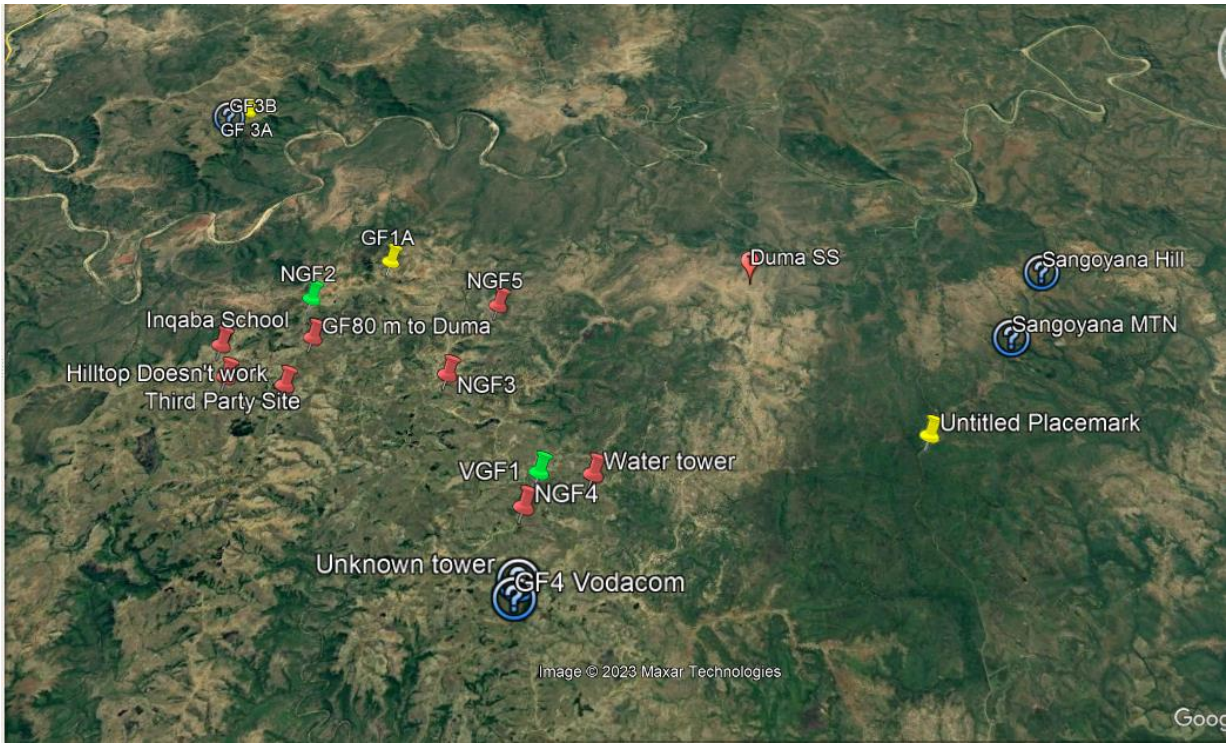

Figure 5: Telecomms Site alternative investigations

2.3.2 **Design Alternative**

Two **tower design** alternatives have been invested by the team namely:

Lattice Towers

Also referred to as "self-supporting towers", lattice towers are typically made from steel and constructed in a triangular or square shape. These towers often offer the most stability and flexibility as compared to other cell tower types.

Monopole Towers

A single tubular mast comprises this type of cell tower; because of the instability that comes with the use of a single pole, the height of these structures will not exceed 200 feet. A benefit of this tower type is that it requires little ground space to erect, and the antennae are simply mounted to the top-exterior of the mast.

The preferred tower type by Eskom is a self-supporting steel lattice tower (**Figure 6** for example). *Eskom has moved away from this type as it is very difficult to maintain during its lifetime. According to the Eskom technical team, they currently don't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. We have also found that Lattice structures are more robust and durable for our network needs*

2.3.3 **Layout alternative**

Two heights are proposed height of 65m and 85m have been investigated for the Duma RS.

The final height is depended if Duma is connected to the NGF2 and VGF1 pair (65m) or to the GF1A and GF3A pairs which are 85m.

Figure 6:: Typical telecom tower

2.3.4 **No-go alternative**

The No-Go alternative in the context of this project implies that the telecommunication mast would not be constructed and the current land use would persist. If the project does not proceed the negative impacts such as risk of collisions of birds would be avoided. However, it would also mean that the project would not provide the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Based on above points, the 'No-go' alternative is therefore not considered to be a feasible alternative and will not be considered further within the EIA process.

2.4 Need and Desirability

The proposed telecommunication mast is required to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors. The proposed mast installation project will align with Eskom's objectives to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Eskom Holdings SOC Ltd considers this area to be highly preferred for the development for the following reasons:

This spot is required because it best suits the needs to integrate back into the Eskom telecommunication's network. In order for Eskom to provide the necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

The mast will be situated with the approved within approved Duma 400kV Main Transmission Substation, and as the Mast will be situated within the Duma site, no alternative site locations have been investigated during the basic assessment process. Of the potential impacts only, the visual impact has been assessed in detail as it believed that there would be no other significant impacts as a result of the location of the mast. The visual impact associated with the mast was shown to be confined to the Duma substation area with minimal impact on the surrounding environment. The proposed mast therefore found to be acceptable as the potential impact can be mitigated to an acceptable level.

The proposed project is part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade. These suits of projects will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue. The Mthonjaneni Local Municipality which have high levels of unemployment and this project may provide a much-required capital injection to the area, along with a number of job opportunities during the construction and operational phases.

2.5 Construction & Operation of the Tower Procedure

The proposed telecommunication radio tower project is considered a medium scale development that will require specialist construction methods to erect it. The footprint of the tower is only 16mx16m, but its vertical dimension reaches 85m. Limited detail and descriptive information are available, but one can assume the following typical construction phases may occur:

- Surveying of the site;
- Establishment of a temporary construction camp and material stockyard that could be on- or off site depending on suitability;
- Installation of a power supply (no details available);
- Civil works which include an access road if not already present, foundation casting and erection of the tower;
- Construction of security features such as a fence; and
- Commissioning and rehabilitation.

The establishment of a construction camp is usually one of the first interventions on a construction site and is normally located on or near the site. Temporary site offices and ablution facilities may be required next to a material laydown yard. Due to its temporary nature and practical function, aesthetic considerations are less of a concern which could result in an unsightly terrain that may cause visual intrusion.
Earthworks for foundation purposes will be one of the most intrusive activities and will presumably consist of excavation via appropriate machinery followed by foundation casting. The erection of the tower could involve the use of a mobile crane or even helicopters, depending on site conditions.
No clear construction period has been determined. One can expect a relatively short construction period of a few months.

The final project will entail a 85m tall lattice tower, typically painted with white and red, or as per aviation authority requirements. It will be equipped with radios and dishes near the top. A red blinking light is expected to be

installed at the top, as a notice to air traffic at night. Once the tower is constructed a routine maintenance program will be followed. No specifics are available, but no additional visual impacts are expected.

3 LEGAL FRAMEWORK AND REQUIREMENTS

3.1 Listed Activities

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 326, 327, 325 & 324 (as amended), a Basic Assessment process is required for the proposed project. **Table 1** contains the listed activities in terms of the EIA Regulations (as amended) and includes a description of those project activities which relate to the applicable listed activities.

Table 1: BA Listed Activities Applicable applied for to be authorise

Listed activities	Description of project activity that triggers listed activity
Activity 3 of Listing Notice 3 (GNR 324, 07 April 2017): The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower— (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height— **(d) Kwazulu-Natal:** xi Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority xii Outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	The mast will be 85m in height, thereby exceeding the 15m threshold; and will be constructed within a Sensitive area as identified in an environmental management framework and within 5km of a terrestrial protected area identified in terms of NEMPAA (i.e. Hluhluwe-iMfolozi Park)

3.2 Legislation and Guidelines that have informed the preparation of this BA Report

Several other Acts, standards or guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 2**, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 2: Relevant legislative and permitting requirements applicable to the proposed project

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GNR 982 of 2014 (as amended), a Basic Assessment Process is required to be undertaken for 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 telecommunication mast 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).***	Department of Forestry Fisheries and Environment (DFFE) – competent authority KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZN EDTEA)
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts. ***While no permitting or licensing requirements arise directly by virtue of the proposed project, this section will find application during the BA phase and will continue to apply throughout the life cycle of the project.***	DFFE KZN EDTEA
National Water Act (Act No 36 of 1998)	The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses: • Section 21(c) impeding or diverting the flow of water in a watercourse and; • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. ***Considering the negligible to likely non-existent impacts, it is debatable whether the project activities even constitute a Section 21(c) and 21(i) water***	Department of Water and Sanitation (DWS)

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	use. This will need to be confirmed with the DWS. If the project activities are considered a water use, A General Authorisation will be applicable.	
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas	DFFE Local Municipality

National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including
	  » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length;
	  » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent
	» The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided.
	» Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.
	
	The Tower site is 16m x 16m hence an HIA is not required as the development which will not change the character of a site exceeding 5 000 m2. However, a permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development
		South African Heritage Resources Agency (SAHRA)
		
		AMAFA

National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and	DFFE KZN EDTEA

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	invader plants. ***An ecological study has been undertaken as part of the BA process, as such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered within this report***.	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated" GN 908 provides a list of protected tree species. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of Forestry Fisheries and Environment
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of Forestry Fisheries and Environment
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force. ***It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health***	Department of Health
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by –	DFFE: Chemicals and Waste Management

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	» Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. ***As no waste disposal site is to be associated with the proposed project, no permit is required in this regard. Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr. The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license***.	KZN EDTEA: General waste
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. ***An abnormal load/vehicle permit may be required to transport the various components to site for construction.***	Provincial Department of Transport
Conservation of Agricultural Resources Act (Act No 43 of 1983)	The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) has categorised a large number of invasive plants together with associated obligations of the land owner. Invasive plant species that should be removed or maintained only under certain commercial situations are identified in terms of the CARA. This Act will be applicable to the project if and where such plants arise within or adjacent to the project area. Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. ***While no permitting or licensing requirements arise from this legislation, this Act will find application during the BA process and will continue to apply***	DFFE

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	throughout the life cycle of the project.	
Telecommunications Act, 1966 (Act No. 103 of 1966)	Transnet has authority to operate its Private Telecommunication Network (PTN) in terms of Section 41(1)(c) of the Telecommunications Act.	
Aviation Act, 1962 (Act No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997	Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an OBSTACLE and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer SA-CAR Part 139.01.33) ***Due to requirements of the Act to ensure the safety of aircrafts, the developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility. The developer must ensure that aviation impacts are prevented by ensuring that the mast is clearly visible to air traffic. The mast will be equipped with navigations lights. The mast will not be located in close proximity to any runways that could affect safety of planes approaching/leaving a runway.***	
PROVINCIAL		
KwaZulu-Natal Nature Conservation Management Amendment Act, 1997 (No 5 of 1999)	The KZN Conservation Management Amendment Act (1999) provides for the establishment of the KZN Conservation and prescribes its powers, duties and functions which include • Direct Nature management; and • Direct protected areas management ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Environmental Biodiversity Protected Areas Management Bill, 2014	The KZN Environmental Biodiversity Protected Areas Management Bill of 2014 provides for the establishment, functions and powers of the Ezemvelo KZN Wildfire the protection and conservation of indigenous species, ecological communities, habitats and ecosystems, the sustainable use of indigenous biological resources and the declaration and management of protected areas; • Schedule 3, 7 and 8 of includes the lists of protected fauna and flora species. ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species. The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Systematic Conversation Plan (KZNSCP, 2012)	The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats. ***The proposed development needs to consider the future conservation planning of the area in order to ensure that no conflict in the future land-use will occur.***	Ezemvelo KZN wildfire (EKZNW)

3.3 Guidelines documents and standards

The following Guideline documents have been considered in the preparation of this report:

- South African National Standards (SANS) 10328 (Methods for environmental noise impact assessment in terms of Nema 107 of 1998);
- The Equator Principles (June 2003);

- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010; and
- KwaZulu-Natal Spatial Development Framework
- District and Local municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).
- Municipal by-laws and guidelines.
-

3.4 Summary of the Requirements of Appendix 1 of the 2014 NEMA EIA Regulations

Table 3 below details how the legal requirements of **APPENDIX 1** of the 2014 EIA Regulations **(as amended, GNR326)** have been addressed within this report.

Table 3: Legal requirements in terms of the 2014 EIA regulations

Appendix 1: CONTENT OF BASIC ASSESSMENT REPORTS	Cross-reference in this BAR report
Scope of assessment and content of basic assessment reports	
3. (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	Appendix G1
(a) details of—	
(i) the EAP who prepared the report; and	
(ii) the expertise of the EAP, including a curriculum vitae;	
(b) the location of the activity, including:	Appendix G3
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;	
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Appendix A & Appendix G3
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;	
(d) a description of the scope of the proposed activity, including—	Section 3.1
i. all listed and specified activities triggered and being applied for; and	Section 2.2
ii a description of the activities to be undertaken including associated structures and infrastructure;	
(e) a description of the policy and legislative context within which the development is proposed including—	Section 3.2
iii. 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	
iv. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 2.3
(g) a motivation for the preferred site, activity and technology alternative;	Section 2.3)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including—	i. Section 2.4 ii. Chapter 4 & Appendix D

i. details of all the alternatives considered; ii. details of the public participation process 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 interested and affected parties, 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 identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; 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;	iii. Appendix D: Public Participation Process iv. Chapter 5 v. Chapter 6 vi. Chapter 7 vii. Chapter 7 viii. Chapter 7 ix. Chapter 7 x. Section 2.4 xi. Section 8.4
(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 environmental impact assessment 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 7
(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 7
(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 8 (section 8.1)
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas tha should be avoided, including buffers; and	Chapter 8 (section 8.4)

(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
(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 8
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 6 (Section 6.7)
(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 8 (Section 8.4)
(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 interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Appendix G1
(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) Where a government notice *gazetted* by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply	N/A

4 PUBLIC PARTICIPATION/STAKEHOLDER ENGAGEMENT PROCESS

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment Regulations, Published in Government Notice R326 (as amended)**. In addition, the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010 **as well the approved PPP Plan from DFFE (attached in appendix E4).**

4.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process is an important part of any environmental Impact assessment. The main objectives of the Stakeholder Engagement / Public Participation Process include amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

4.2 Public Participation Undertaken

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, the following key public participation tasks are required to be undertaken:

- Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- Giving written notice to:
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority.
- Placing an advertisement in:
  - (i) one local newspaper; and

(ii) in at least one provincial newspaper.

- Open and maintain a register/ database of interested and affected parties and organs of state.

» Release of a Draft EIA Report for Public Review

» Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

In compliance with the requirements of Chapter 6 of the EIA Regulations, 2014, the following summarises the key public participation activities conducted to date.

4.2.1 **Stakeholder and land owner Identification**

Identification of I&APs was undertaken by Envirolution through existing contacts and databases, recording responses to site notices and the newspaper advertisement, as well as through the process of networking. The key stakeholder groups identified include authorities, local and district municipalities, public stakeholders, Parastatals and Non-Governmental Organisations (refer to **Table 4.1**).

Table 4.1: Key stakeholder groups identified during the EIA Process

Organisation	I&APs type	Designation	First Name Last Name
Department of Environment, Forestry & Fisheries		Biodiversity Directorate	Seoka Lekota
KZN Department of Economic Development, Tourism and Environmental Affairs.	Provincial Authority	EIA Coordinator:	Kacy Rengasamy
KZN Department of Economic Development, Tourism and Environmental Affairs (King Cetshwayo District Municipality)	**Provincial Authority**	**Assistant Director: Environmental Impact Assessment Environmental Services**	Mr Muziwandile Mdamba
Ezemvelo KZN Wildlife	Provincial Authority	Conservation Planning	Nerissa Pillay/ Dinesree Thambu-Moodley
Department of Water & Sanitation (Pongola-Umzimkulu WMA)		Water Quality Management	Lwandle Sibango
Department of Water and Sanitation	Provincial Authority	Acting Deputy Director: Water Quality Management:	Mr Strini Govender.
Department of Agriculture, Forestry & Fisheries (DAFF)	Provincial Authority	Directorate: Forestry Regulations and Oversight	Wiseman Rozani Jeffrey Maivha Ayanda Mnyungula
KZN Department of Roads &Transport	Provincial Authority	Chief Director: TIRS: Ladysmith	Ms. B. Nogwanya
KZN Department of Roads &Transport	Provincial Authority	Manager: Road Infrastructure Develop & Management	Judy Reddy
KZN Department of Agriculture and Rural Development	Provincial Authority	Head of Department (personal assistant: Zakithi Mathenjwa)	Mr Siza Sibande

KZN Department of Cooperative Governance and Traditional Affairs	Provincial Authority	Head of Department	Mr T Tubane
KZN Department of Public Works	Provincial Authority		Xolile Ntanzi Meryl Naicker
KZN Provincial Heritage Authority (AMAFA)	Provincial Authority	Archaeology sites Impact Assessments Archaeology Permits	Bernadet Pawandiwa
KZN: COGTA (King Cetshwayo District)	Provincial Authority	Deputy Director:	Mr Mbuso Sikakane
King Cetshwayo District Municipality	Local Authority	Executive Mayor:	Cllr Thembeka Mncunu,
King Cetshwayo District Municipality	Local Authority	Municipal Manager:	MRS M NDLOVU
Mthonjaneni Local Municipality	Local Authority	Municipal Manager:	Mr PP Sibiya
Mthonjaneni Local Municipality	Local Authority	Mayor	Cllr. SBK Biyela –
Mthonjaneni Local Municipality	Local Authority	Office of the Speaker	Cllr. NA Mbatha
Mthonjaneni Local Municipality	Local Authority	Director Technical Services	Mrs SS Mchunu
Mthonjaneni Local Municipality	Local Authority	Ward 13	Cllr. Thulani Ephraim Mpungose
Obuka Traditional Council	Local Authority	Traditional Authority	PC Biyela

4.2.2 **Stakeholder Database**

An I&AP's register was opened and maintained in terms of Regulation 42 and contains the names, contact details and addresses of:

i. 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;
ii. all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
iii. all organs of state which have jurisdiction in respect of the activity to which the application relates.

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix E8**). While I&APs were encouraged to register their interest in the project from the onset of the process undertaken by Envirolution Consulting, the identification and registration of I&APs has been on-going for the duration of the BA process.

4.2.3 Placement of Site Notices & Newspaper advertisement

Site notices will be displayed in different points within the study area. Newspaper advertisement will be placed in *local newspaper requesting* Interested and Affected Parties (I&APs) to register, and submit their comments.

Proof is included in **Appendix E1 & E2**

4.2.4 Written notifications

A Background Information Document was produced and distributed during the initial PPP phase in March 2021 in the form of an email distribution to registered I&APs prior to the release of the Draft Report for review.

These are all included in **Appendix E2.**

4.2.5 Public Review of the Draft Basic Assessment Report

i. Stakeholder:
English and isiZulu Adverts is placed in the local Newspapers notifying registered IAPs of the availability of the draft BAR. The draft BA Report is publicly made available to all registered I&AP's from from **23 June 2023 to 24 July 2023** at the following places:

- **MELMOTH LIBRARY**
- **Dropbox** link sent to registered I&APs via email
- **Email** copy of the BAR document (without appendices) sent to registered I&APs via email

ii. Authority: The Draft BA Report was sent to (amongst others):
- Department of Forestry, Fisheries and Environment (Biodiversity Directorate).
- KZN Department of Economic Development, Tourism and Environmental Affairs
- Department of Water and Sanitation
- Ezemvelo KZN Wildlife
- King Cetshwayo District Municipality
- Mthonjaneni Local Municipality

4.2.6 Public consultation

In order to provide information regarding the proposed project and the BA process, a background information document (BID) for the project was compiled at the outset of the process. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in order for I&APs to have their issues noted. I&APs will be consulted through the following means:

- Written, faxed or e-mail correspondence
- Virtual meetings,
- One-on-one Telephonic consultation with directly affected or surrounding landowners;

- If required, Focus Group Meetings will be held with different parties (i.e. landowner, local municipalities etc.) with limited number of participants in order to adhere to the current Level 1 Covid-19 safely measures.

Any minutes of meeting held will be captured within **Appendix E6**.

4.2.7 Comments and Responses Report

At the end of the announcement phase, all comments/input from stakeholders and I&AP's, will be captured in the Issues and Response Report (IRR) which formed part of the Final BA Report. The Comments and Response Report includes responses from members of the EIA project team and/or the project proponent. This is included in **Appendix E7.**

4.3 Summary of Issues Raised by I&AP's

Issues and concerns raised by I&AP's during this process will be integrated into the Issues and Responses Report of the Final BAR. The issues and concerns were raised by means of:

- issues raised during open day meeting and focus group meetings;
- written submissions in response to advertisements
- Telephonic communications with I&AP's;
- Issues raised through written correspondence received from I&AP's (fax, email and mail).

Issues raised during the previous EIA Process

A draft Basic Assessment Report (DBAR) was **first released for public review in June 2021** for a 30-day public review period., Ezemvelo Wildflife raised the following some Issues & concerns:

1. **Correspondence dated 01 August 2021**: Applications as currently proposed have the potential to (1) have severe impacts on important biodiversity features (of particular concern are threatened vulture species and other avifaunal species) and Protected Areas, and thereby negatively impact upon the provinces conservation goals and targets, and (2) foreclose upon opportunities for securing critically important habitats for the purpose of biodiversity conservation. Subsequently, this places the iMfolozi BEN at risk, as reduced biodiversity value will impact the economic value and development potential. Given the above, it is strongly recommended that the DBARs be Rejected as:
   i the DBARs have failed to appropriately assess the significance of the abovementioned impacts, particularly from a cumulative impact point of view and especially with regards to the cumulative visual impact upon Wilderness areas within a protected area;
   ii insufficient/no effort has been made to assess appropriate alternatives, for example: the use of existing towers, alternative tower locations, several shorter towers, etc;
   iii the proposed mitigatory measures are inappropriate and do not adequately safeguard critically important biodiversity, as further investigations are still required;
   iv the proposed mitigatory measures are considered weak, in that they are not specific and would result in a conditional authorisation (if authorised), as the outcomes of additional investigations are unknown. To propose further investigation of tower design after authorisation, as mitigation, is flawed, as different designs have different impacts to birds, if these impacts are not known upfront it may have an impact on not only the vultures, but also the financial feasibility of the project and aviation safety;

v the application as currently proposed has significant long-term implications for one of KwaZulu-Natal's flagship Protected Areas, i.e. Hluhluwe iMfolozi Park (HiP); and
vi the increase in disturbance within the area will foreclose upon opportunities for securing critically important habitats, for the purpose of biodiversity conservation and meeting provincial and national conservation goals and targets.

2. Subsequently on the 07 December 2022, Ezemvelo submitted further comments particularly on the Visual Report stating that:
"*Upon reviewing the two Visual Impact Assessments for the proposed Duma and Greenfields sites, Ezemvelo was extremely concerned that the purpose and function of the Wilderness Area within Hluhluwe iMfolozi Park was not fully understood and hence the level of confidence in the assessment of the visual impact is very low. Ezemvelo therefore contacted the specialist that undertook the assessment to query the lack of acknowledgment of the importance of the wilderness area, where it became evident that the specialist had not reviewed Ezemvelo's correspondence of 01 August 2021 (which detailed the value and use of the wilderness area). It was further concerning that upon being informed of this additional information, the specialist still did not fully comprehend the potential impact. In addition, the specialist indicated that he did not take into account the lighting impact that the proposed Towers would create (as he was unaware that lights would be used on the towers).*
Given the above, Ezemvelo deems the visual impact assessment for the proposed Duma and Greenfields sites to be inadequate. It is thus strongly recommended that the use of existing tower sites be investigated. Should the heights of the existing towers need to be increased, the overall impact will be less. The applicant is strongly urged to engage with existing tower owners to set up a MoA/U for the appropriate management of these specific towers.
Should the applicant still wish to pursue the preferred sites, the Visual Impact Assessments need to be updated with the additional information highlighted above"

(See **Appendix E4** for the full correspondences).

3. A meeting was held with the Eskom Team, Ezemvelo Wildlife representative and the Visual Specialist on the 07 March 2023 in an attempt to address Ezemvelo concerns (please refer **to Appendix E5** the minutes of the meeting). The discussion mainly touched on the issue of alternative sites and the Visual assessments.

In order to address the above concerns, this Basic Assessment Report has been revised to speak to:

- Alternative site investigations (see section 2.3);
- Visual Impact Assessments (Revised);
- Terrestrial Biodiversity Impact Assessment Report (Revised); and
- Aquatic and Wetland Impact Assessment (Revised);

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides a description of the environment that may be affected by the proposed project, as stipulated in the EIA Regulations (Appendix 3) Section (h) iv). The requirement is that the description of the footprint should focus on the Geographical, physical, biological, social, economic, heritage and cultural aspects. The environmental specialist studies that were undertaken to inform this section of the BA Report and have focussed on significant environmental issues of the project.

5.1 Land use and Landcover

The study area falls within the uMfolozi Biodiversity Economy Node (UBEN) which was initiated in 2014 in partnership between Ezemvelo KZN Wildlife and South African Hunters and Game Conservation Association (SAHGCA). The UBEN links various protected areas and other areas of conservation importance, owned and managed by the public-, private sectors and/or local communities, in order to establish economic opportunities while conserving rich wildlife and cultural diversity (Figure 5). Private sector funding has already been secured which will include wildlife-based industries such as lodges and hunting operations. Other offshoot industries for example meat processing, tannery and taxidermy may be stimulated and thereby support the rural economy to alleviate poverty.

The natural vegetation cover in the study area consists mostly of the Zululand Lowveld vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2018)) which is a combination of homogenous savannah vegetation patterns, known for its tall grasslands, interspersed with groupings of thorn trees or dense woodlands along drainage lines. The study area is considered natural/rural with a sparse network of roads leading to widely distributed settlements and villages. The rural settlements consist of simple structures, often rondavel type buildings or small square houses, loosely grouped together and sparsely distributed. Informal subsistence farming occurs in the open spaces between the houses and are mostly recognised by free roaming livestock and small cultivated fields. The less accessible areas along rivers and on the steeper slopes portray a natural character and consist of the denser vegetation type as described previously.

The only major road in the study area is the P700 which connects to Ulundi in the north and meanders through the rural areas to Ntambana in the south. A sparse gravel road network taps off from the P700 to connect to the widely distributed villages. The Hluhluwe-iMfolozi Park's (HiP) southern boundary is located approximately 5km to the northeast of the project site. The park is considered a major tourist attraction and occupies approximately 960km². According to the viewshed analysis, the southwestern corner of the park may be affected. According to the Hluhluwe-iMfolozi Park Protected Area Management Plan (2011) this particular part of the park is considered a pristine wilderness area and no tourist camps or access roads are located in this area apart from ranger patrol roads along the boundary fence, therefore no tourists can visit this part of the park at this stage.

In recent years, the Obuka- and Somopho Community Nature Reserves extended the conservation area further south within 3km of the tower site. These are areas considered under the KwaZulu-Natal Protected Area Expansion Plan and identified areas of priority for protected area expansion. With this, new tourism opportunities could be developed in support of socio-economic benefits. The Mthembu & Biyela lodge are located in the mFulaWozi Wilderness Private Game Reserve. Parallel 400kV transmission lines traverse the study area from a southeastern to northwestern direction. It passes the proposed Duma telecommunication tower site near the P700. These are the only major electrical infrastructure currently in the study area. The future Duma Substation has received environmental authorisation and it is important to note that this will form part of the future landscape character. The proposed Duma tower will be located inside the footprint of the substation.

The study area is largely undeveloped with the exception of the scattered rural villages and the existing transmission lines. It has a natural-rural character with the natural vegetation type mostly intact along the drainage lines and mountain slopes. The areas inside and surrounding the settlements have been slightly transformed to accommodate the residents' subsistence lifestyle. The large expanse of savannah is homogenous and although pleasant in terms of its visual quality, is not considered exceptionally unique. The low rounded mountains provide visual variation and contributes to a natural backdrop. The larger rivers such as the White-iMfolozi in the northern part of the study area has carved a shallow canyon through the landscape and is considered an exceptional feature in the study area which forms a link between the HiP and the Opathe Game Reserve.

5.2 Biophysical Attributes/Features of the Study Area

Geographical features are man-made or naturally-created features of the Earth. Natural geographical features consist of landforms and ecosystems.

5.2.1 Climate

The Climate data was obtained from the national Land Type Survey (Turner et al, 1986). The climatic profile of the area can be described warm and temperate. The mean monthly rainfall is the highest in the month of January at 97 mm and lowest in the month of June at 11 mm of rainfall. About, 533 mm, or 83.28% of the annual average rainfall of 640 mm falls in the summer growing season (September to March). The mean monthly temperature is highest in January at 24.2 C and the mean monthly temperature is lowest at 16.1oC in the month of July.

5.2.2 Topography and Geology

The natural topography is considered moderately varied with an elevational range of between 700m and 100m. The topography consists of rounded individual hills or consolidated ranges joined with low lying undulating plains. Shallow depressions in the landscape follows the path of the rivers and streams. A general downward slope occurs from the west to the east. The tower site is located on an undulating plain between the Mayayeni- and Munywana Rivers (**Figure 7**). Due to the location of the site in reference to the topography, and the height of the proposed tower, it is determined to have an extended ZVI. The moderately varied topography near the tower site and towards the east will have limited screening effects, but the elevated terrain towards the north, west and south creates a fractured visibility pattern and limits the ZVI mostly to 5 km, as illustrated in Figure 15 & Figure 16. The topography is expected to provide a low screening potential within the <2 km zone (ZMVE) and towards the east, but a medium to high screening potential at greater distances from the tower site, in particular to the north, west and south.

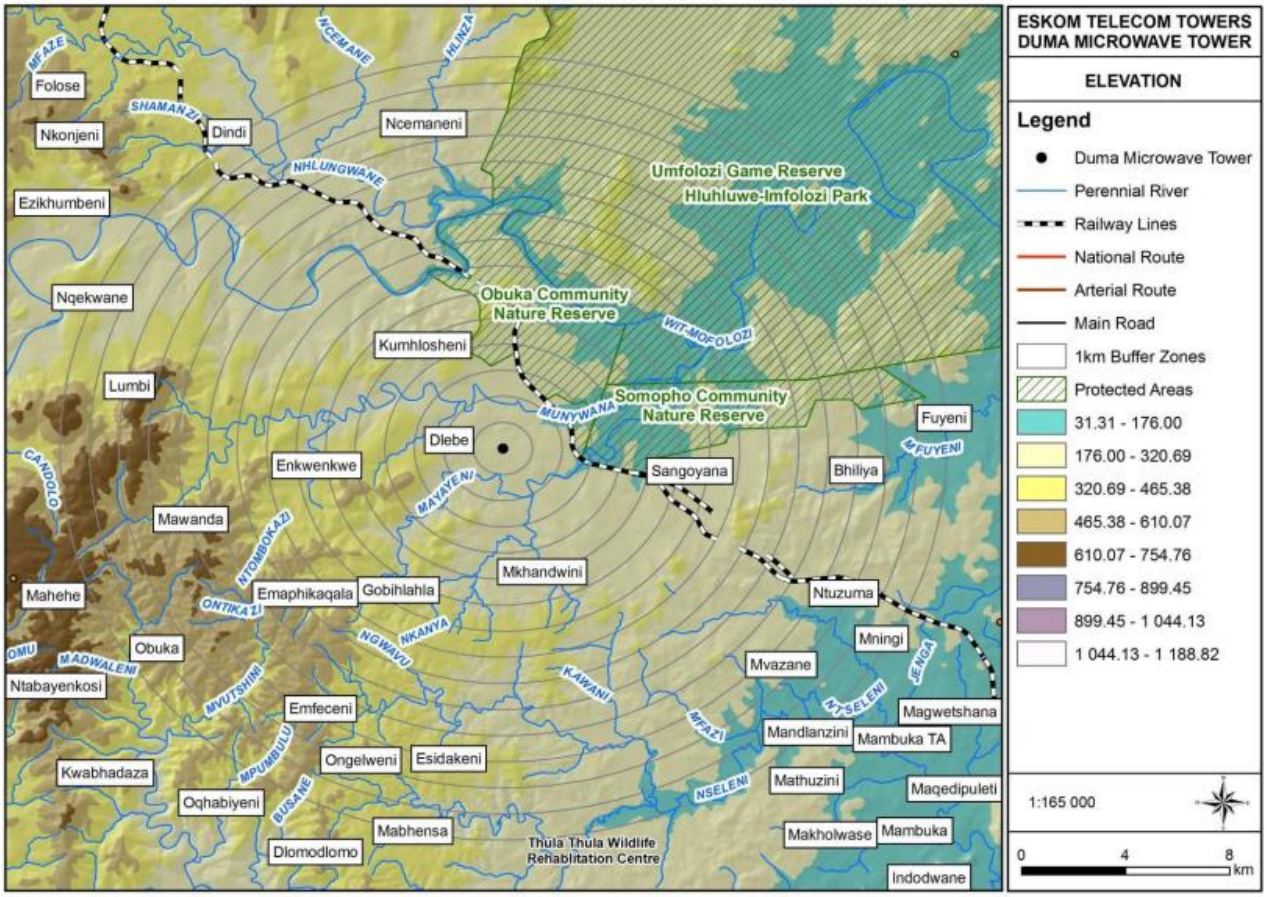

Figure 7: Regional elevation map

5.2.3 **Soil and Agricultural Potential**

The project site falls under the land class type Fb314 which comprises of soils soil forms are rocky or soils with shallow depth limited by hard rock. 4.4% of soils under the Fb314 soil classification can be classified as Rocks, while 47.4% can be classified as Williamson Gs16, 15.8% as Mispah Ms10, 17.8% as Rosehill Sw30, Swartland Sw31, 5.1% as Jozini Oa36, Koedoesvlei Oa37, etc. The soils have clay content varying between 15% and 35% with the average clay content of the site at 24.9%. The soil depth of the area varies between 100mm and 1200mm with the average depth of the site at 397.6mm.

The vegetation of Duma Tower Site is classified lower altitude dense bushveld, savanna and grasslands, extending up to higher altitude mistbelt grasslands, including significant areas of mistbelt and forests. There is no evidence of cultivated areas across the project site based on the Google imagery below. Also based on the land use map of the area, there are no commercial agricultural activities in the area except for homesteads and scattered forest.

The area has low to medium potential for agriculture based on the classification indicated in **Figure 8**. The agricultural value of the area is low due to lack of commercial agricultural productivity in the area. Therefore, based on the fact that the site area has low agricultural productivity level, the land can be utilized for the proposed Duma Tower construction. The area required (900 m2) for constructing the tower will not have significant impact on the area available for agriculture.

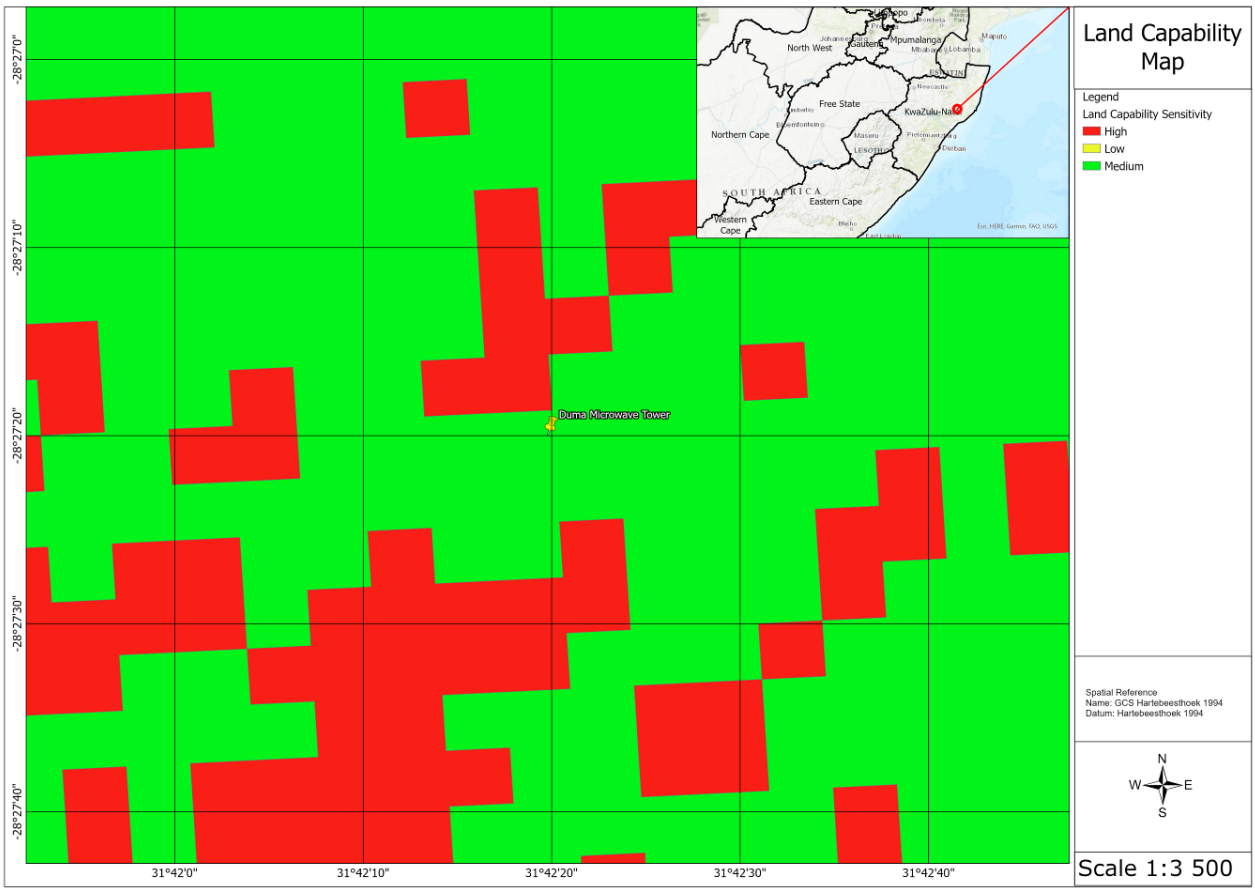

Figure 8: Duma Tower Land Capability Map

5.3 Water Resources of the study area

Drainage and River Setting: The tower site is located on a gentle north-east facing slope that is part of a broad ridgeline. According to the national quaternary catchment dataset, the site is located within catchment W21L that is drained by the perennial White Imfolozi River. The tower site and associated slopes drain into a small ephemeral stream located approximately 200m downslope and south-east of the tower. The ephemeral stream drains into the Munywana River which is a right-bank tributary of the White Imfolozi River (**Figure 9**).

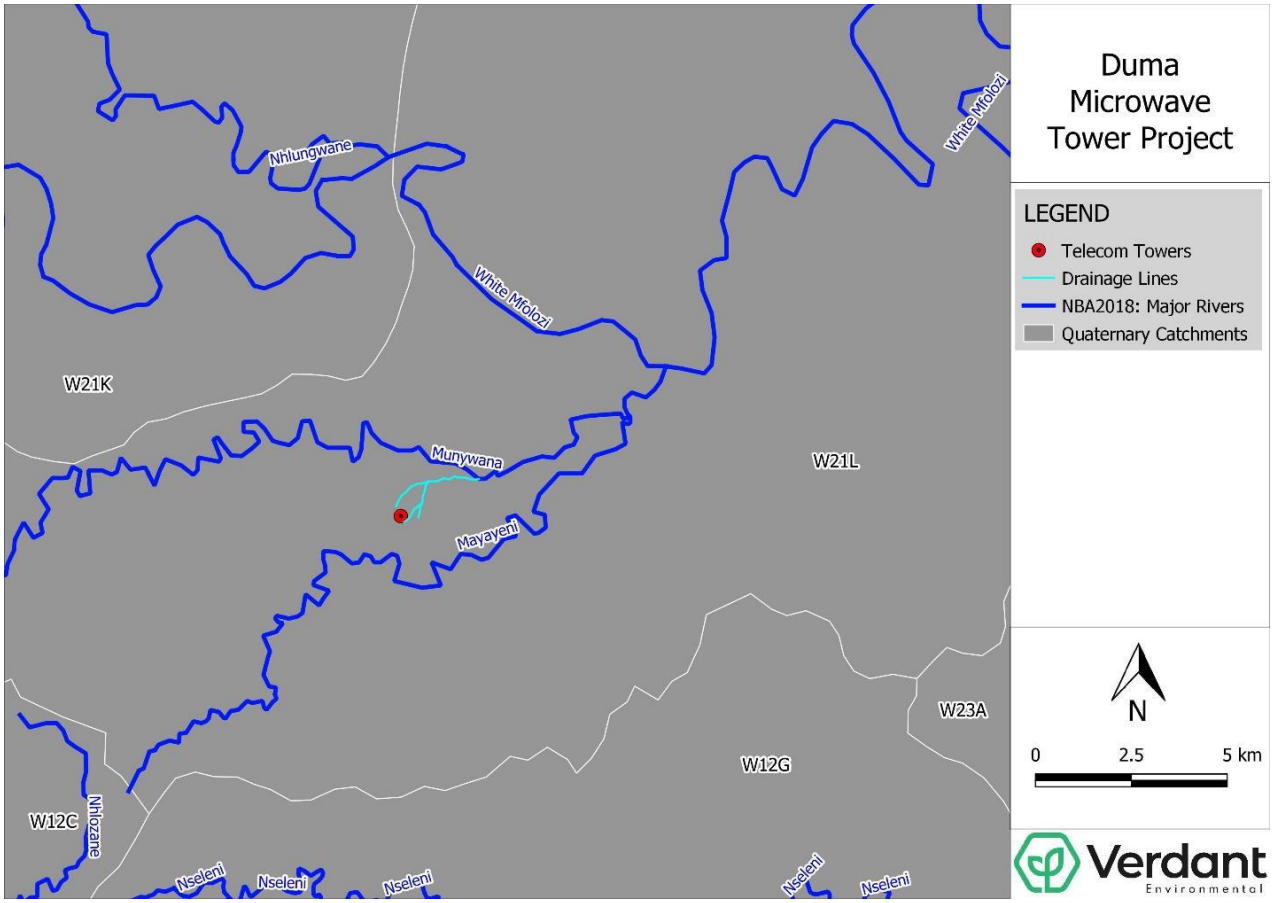

Figure 9: Drainage and river ecosystem setting of the study area.

5.4 Terrestrial Biodiversity

5.4.1 Vegetation

Vegetation Overview: The vegetation is shown in National Vegetation Mapping (SANBI, 2018) as Zululand Lowveld (Mucina & Rutherford 2006, p. 506). The main occurrence is from south-eastern Swaziland into Zululand, including Mkuze, Hluhluwe, Ulundi. These authors describe it as comprising:
"Extensive flat or only slightly undulating landscapes supporting complex of various bushveld units ranging from dense thickets of *Dichrostachys cinerea* and Acacia species, through park-like savanna with flat-topped A. tortilis to tree dominated woodland with broadleaved open bushveld with *Sclerocarya birrea* subsp. caffra and A. nigrescens. Tall grassveld types with sparsely scattered solitary trees and shrubs form a mosaic with the typical savanna thornveld, bushveld and thicket patches." The threat status of this vegetation type is Least Concern (Skowno et al. 2108) and it is moderately protected.

Conservation Context: A summary of the conservation planning and threat status of the ecological features in the study area is provided in **Table 4** below. Noteworthy features include:

- Zululand Lowveld is currently listed as **Least Concern** in the NBA (SANBI, 2018).
- Zululand Lowveld is currently listed as **Vulnerable** in the KZN ecosystem conservation assessment (Jewitt, 2011).
- The relevant reach of the Munywana River is currently listed as **Least Concern** in the NBA (SANBI, 2018).

- The sub-quaternary catchment within which the study area is located is classified as a **Upstream Management Area (UMA)** (CSIR, 2011).
- The site itself is not located within any Critical Biodiversity Area3, however, the surrounding vegetation and habitat (>100m) is earmarked as **Critical Biodiversity Area: Irreplaceable** in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 5.4**).
- The site is located in a small gap in a larger CBA corridor that extends from the Imfolozi Game Reserve in the north to near Heatonville in the south and the eMakhosini-Ophathi Heritage Park in the west.
- In terms of proximity to protected areas, the site is located:
  - 2.4km west of the Somopho Community Nature Reserve.
  - 2.4km south-west of the Obuka Community Nature Reserve.
  - 4.3km south west of the south-western corner of the Hluhluwe-iMfolozi Game Reserve.
- The site is not located within an Ecological Support Area (ESA) or Macro Ecological Corridor. However the site is located 2.4km to an ESA that links Hluhluwe-iMfolozi to the Ngoye Nature Reserve in the south and the 2.6km to an ESA that links Hluhluwe-iMfolozi to the eMakhosini-Ophathi Heritage Park in the west.

Table 4: Key conservation context details for the study area.

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
National Freshwater Ecosystem Priority Areas (NFEPA) (CSIR, 2011)	Rivers	Catchment Planning Unit 3161	Upstream Management Area	Entire study area
2018 National Biodiversity Assessment (SANBI, 2018)	Terrestrial	Zululand Lowveld	Least Concern	Entire study area
	Rivers	Munywana River	Least Threatened	±2.6km downstream
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning Status**	**Location in Relation to Project Site**
KZN Vegetation Map Threat Assessment (Jewitt, 2011)		Zululand Lowveld	Vulnerable	Entire study area
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 1637	Earmarked	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		CBA: Irreplaceable	CBA: Irreplaceable	>100m of the study area

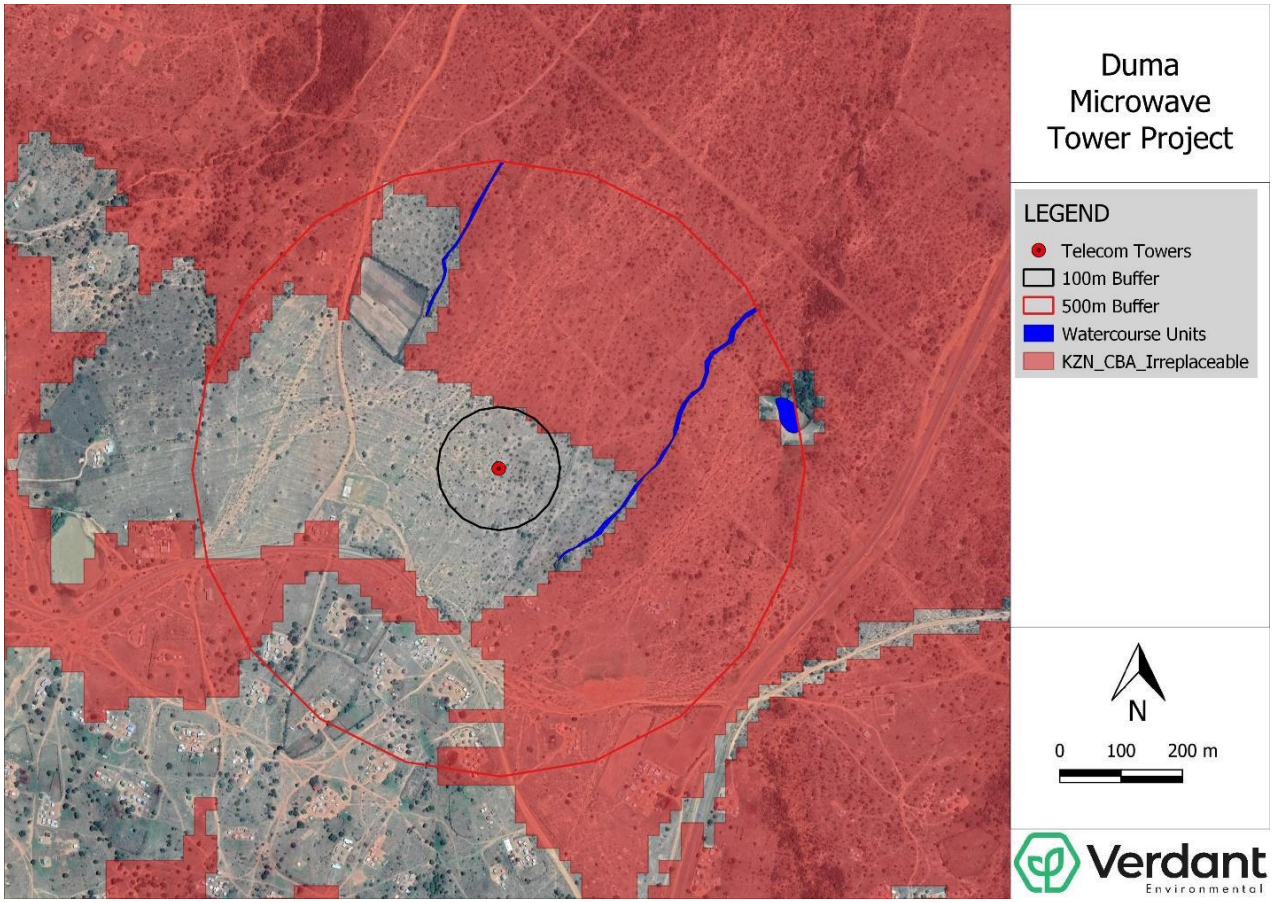

Figure 10:: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to the study area.

Description of Vegetation: This vegetation within 100m of the proposed tower comprises open Zululand Lowveld in which *Vachellia* trees (mainly *V. nilotica*) are most conspicuous. This is a common species. The site is close to a rural settlement and is crisscrossed by animal tracks and human paths. It appears to face significant grazing pressure, indicated by the short stature of the grass and herbs. It nonetheless retains a surprising amount of plant diversity. Few red listed species are associated with the Zululand Lowveld vegetation type. **However, a number of species that are protected but not threatened occur on this site.** These include, within 30 metres of the tower centre point, the following:

- • *Aloe maculata*
- • *Ammocharis coranica*
- • *Ceropegia crassifolia (an uncommon species)*
- • *Huernia hystrix subsp. hystrix*
- • *Huernia zebrina*
- • *Ledebouria macowanii*

In a radius of 50-60 metres of this point there are also examples of *Aloe marlothii, Euphorbia knuthii* and *Stapelia gigantea*. Examples of other typical herbs include*:*

- • *Cucumis zeyheri*
- • *Jatropha hirsuta*
- • *Evolvulus alsionoides*
- • *Hirpicium sp.*
- • *Justicia flava*
- • *Ruellia cordata*
- • *Tragia meyeriana*

For reasons given above, the development of this tower will impact on less commonly seen and protected species and has a higher impact than the other towers in the region i.e. GF1A and GF3A. The entire study area comprises disturbed, open Zululand Lowveld and as such the vegetation communities within 100m were not mapped. The location of protected and rare species within 100m of the tower site are shown in **Figure 5.5**.

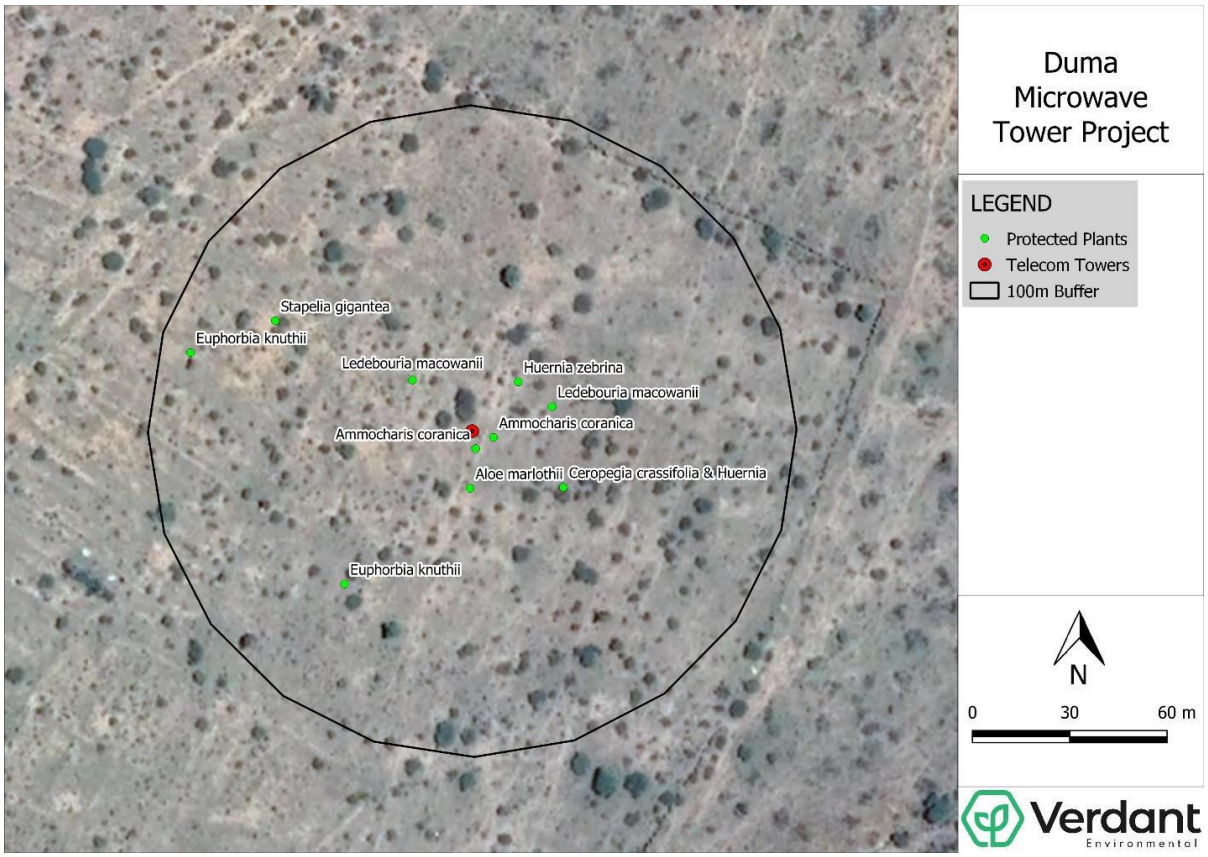

Figure 11:: Protected plants within 100m of the tower site.

Figure 12:: Overview of the overgrazed open Zululand Lowveld at the tower site.

Red Listed Species: No Red Listed species were encountered.

Orange Category Species: No Orange Category species were encountered.

Protected Species: number of species at the sites are protected by provincial conservation legislation. These all require a permit from Ezemvelo KZN Wildlife before they can be disturbed, or relocated. The species are as follows, ordered by plant family

- **Amaryllidaceae**
    - *Ammocharis coranica*
- **Apocynaceae**
    - *o Ceropegia crassifolia*
    - *Huernia hystrix subsp. hystrix*
    - *Huernia zebrina*
    - *Stapelia gigantea*
- **Asphodelaceae**
    - *Aloe marlothii*
- **Euphorbiaceae**
    - *Euphorbia knuthii*
- **Hyacinthaceae**
    - *Ledebouria macowanii*

5.4.2 Fauna

Site Characteristics and Habitat Description: The study area falls within the Savannah Biome4. The site is largely flat and sparsely vegetated with trees and limited grass cover (**Figure 5.7**). There is evidence of overgrazing in the site, with a number of cattle and goats observed onsite. Only one habitat type-savannah-is present onsite i.e. open Zululand Lowveld.

Figure 13: Habitat at Duma Microwave Tower site.

Mammals: Of the 97 terrestrial mammal species known to occur in the region, 17 are Red List species - one is Endangered, nine are Near Threatened and seven are Vulnerable. None of these species, nor any evidence of these, were noted during the site visit. Given the proximity of the study area to a number of game reserves, it is likely that the majority of these species were reported within these protected areas.

Reptiles: According to this dataset, a total of 72 reptile species occur in the region (Appendix B). No reptiles were observed onsite, but suitable habitat exists to support a range of reptile species. Of the 72 species reported for the region, three are Red List species.

Amphibians: total of 38 amphibian species have been recorded in the region, 37 of which are classified as Least Concern and one of which is Vulnerable. Due to the lack of aquatic habitat onsite, it is unlikely that the site is of major importance for amphibian species.

Invertebrate Diversity: Although an extensive invertebrate study was not undertaken at the site, it was noted that there was moderate invertebrate diversity at the site. Most invertebrates observed onsite were Lepidoptera, Orthoptera and Odonata. Some Wolf Spider (Family Lycosidae) burrows were observed onsite. No species of Diplopoda were observed, although suitable habitat is present for such species.

5.5 Avifauna

The planned location of the proposed Duma tower (Duma RS) is on low-lying plains south of the White Imfolozi River (**Figure 14**). The co-ordinates for the site are: -28.455539, 31.705506. It will be sited at an altitude of about 240 m on

flat surrounding terrain (Figures 6). The surrounding habitat comprises low semi-arid thornveld. This site was visited on 3 May 2023.

Figure 14: Location of the proposed Duma tower (Duma RS). The blue line delineates the boundary of the Hluhluwe-Imfolozi Game Reserve/Important Bird and Biodiversity Area (IBA).

Figure 15. View of the Duma RS proposed tower site in low-lying level terrain. The powerlines visible in the background are situated very close to the proposed tower site and will presumably provide the electricity for the tower.

Southern African Bird Atlas Project 2 information

Bird atlas coverage of the general Duma RS and Greenfields proposed tower localities from the online resource of the Southern African Bird Atlas Project 2 (SABAP2, see: https://sabap2.birdmap.africa/) is relatively poor. An examination of a block of nine pentads in this region (2820_3130, 2820_3135, 2820_3140, 2825_3130, 2825_3135, 2825_3140, 2830_3130, 2830_3135 and 2830_3140, Figure 7) shows that all but one of these pentads have only 4-6 bird checklist

cards each. Only the most north-easterly pentad (2820_3140) exceeds this, with 24 cards related to it covering part of Hluhluwe-Imfolozi Park. A pentad covers an area of 5 mins X 5 mins resolution, i.e. about 9 X 8 km. The combined bird data from all nine pentads was therefore used in this investigation, despite five of these pentads not supporting proposed tower localities, in order to provide an adequate sample of the avifauna in this region. A total of 235 bird species have been recorded in the nine pentads combined (Appendix 1), from an amalgamated total of 60 cards.

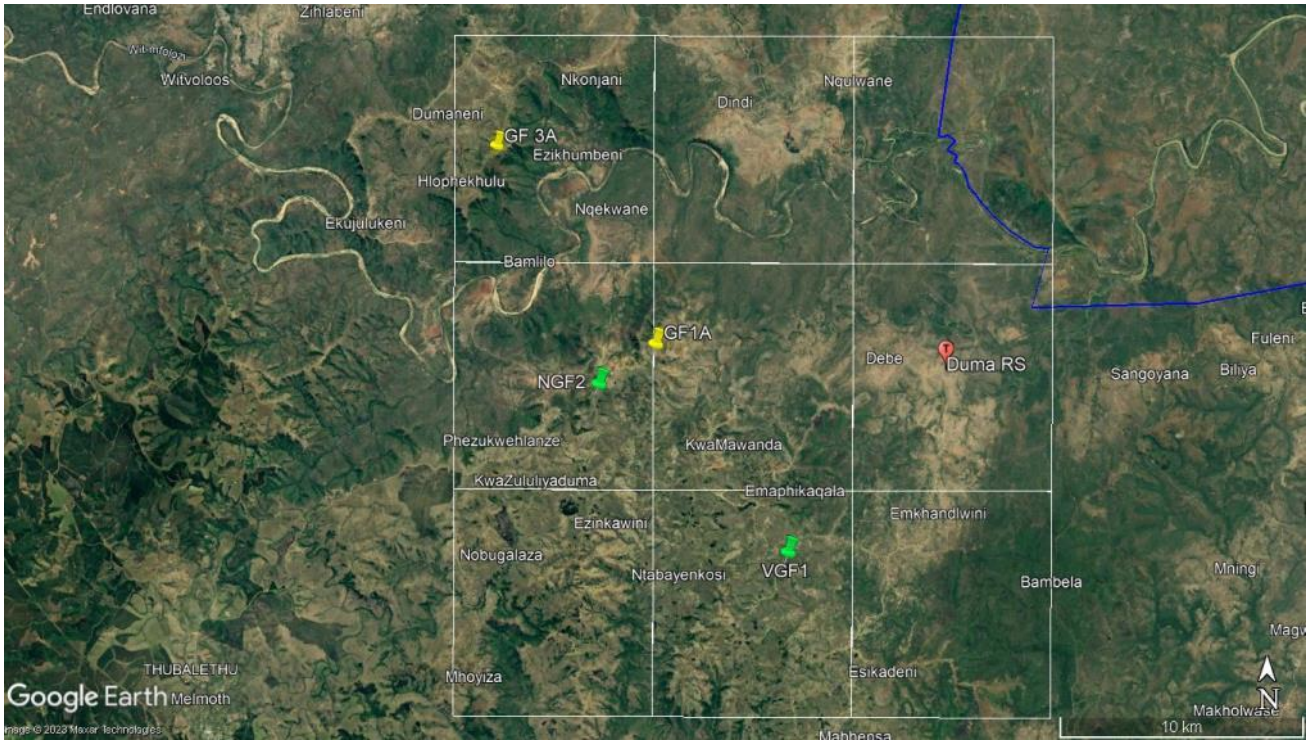

Figure 16: The nine pentads, delineated by the white lines, from the Southern African Bird Atlas Project (SABAP2) for which bird data were extracted for this assessment relevant to the Duma RS and Greenfields proposed towers and tower options, the locations of which are also shown. The blue line delineates the border of the Hluhluwe-Imfolozi Park and Important Bird and Biodiversity Area (IBA).

Fieldwork

The time available for fieldwork associated with this investigation was limited. All eight of the proposed tower locations or location options were visited over a three-day period 2-4 May 2023 (Paulpietersburg ALT RS on 2 May, Louwsberg DPW and Louwsberg CCS RS, Greenfields GF3A and Duma RS on 3 May, Greenfields VGF1 on both 3 and 4 May, and Greenfields NGF2 and GF1A on 4 May). The remote nature of the sites accessed typically on poor roads and widely separated across northern KwaZulu-Natal further limited the amount of time that could be spent at each site.

Nevertheless, the site visits were highly informative in assessing the proposed tower locations relevant to the potential threat they may pose to large flying birds through collisions. At the sites with existing towers (Paulpietersburg ALT RS, Louwsberg DPW and Louwsberg CCS RS) cursory searches were made below and around the existing towers, especially under any lateral support cables, for evidence of bird mortalities caused by collisions, e.g. carcasses, feathers, bones, etc. No such evidence was found. Scavenger action though is known to typically remove any such evidence in many cases.

Particular attention was paid when visiting each potential tower location to searching for and noting details of any large birds found flying in at these locations, including photographing these birds where possible.

Red Data species

A total of 235 bird species has been recorded during SABAP2 in the block of nine relevant pentads that includes the proposed Duma RS tower and the four proposed Greensfields tower options. Ten of these are Red Data species (**Table 5**).

Table 5[1]: Details of the 10 Red Data bird species that have been recorded in the relevant nine pentads during SABAP2 relative to the proposed Duma RS tower and the four Greenfields tower options.

Common name	Scientific name	Full protocol reporting rate (%)	Ad hoc reporting rate (%)	Red Data status nat./glob.
Bateleur,	*Terathopius ecaudatus*	20.0	5.0	EN, EN
Eagle, Martial	*Polemaetus bellicosus*	6.7	0.0	EN, EN
Eagle, Tawny	*Aquila rapax*	13.3	5.0	EN, VU
Falcon, Lanner	*Falco biarmicus*	13.3	0.0	VU, LC
Hornbill, Southern Ground	*Bucorvus leadbeateri*	3.3	15.0	EN, VU
Ibis, Southern Bald	*Geronticus calvus*	8.3	0.0	VU, VU
Secretarybird,	*Sagittarius serpentarius*	5.0	0.0	VU, EN
Vulture, Cape	*Gyps coprotheres*	6.7	0.0	EN, VU
Vulture, Lappet-faced	*Torgos tracheliotos*	3.3	2.5	EN, EN
Vulture, White-backed	*Gyps africanus*	50.0	10.0	CR, CR

All of these 10 Red Data species are large birds that are vulnerable to collisions in flight with artificial structures, especially overhead cables.

The reporting-rate information (Table 5), however, suggests that the Lappet-faced Vulture is rare in this area and likely only a vagrant (reporting rates less than 5%). Four species show relatively high reporting rates (13-50%) and are thus relatively common in these pentads: White-backed Vulture, Bateleur, Tawny Eagle and Lanner Falcon. In addition, the data from ad-hoc atlas cards suggests the possibly that Southern Ground Hornbill may also be relatively common in this area.

Figures 17-17 show the SABAP2 distribution maps for the White-backed, Cape and Lappet-faced vultures respectively for the area of Zululand relevant to the Duma RS and Greenfields proposed tower options. These maps are very much in accord with the maps presented by EZKZNW (see Figures 2 and 3 above) relevant to the 'vulture corridor' extending to the west of Hluhluwe-Imfolozi Park, most markedly in the case of the White-backed Vulture, and directly through the region where these five tower options are located.

[1] Red Data status (nat. – national, glob. – global): CR = Critically Endangered, EN = Endangered, VU = Vulnerable, LC = Least concern.

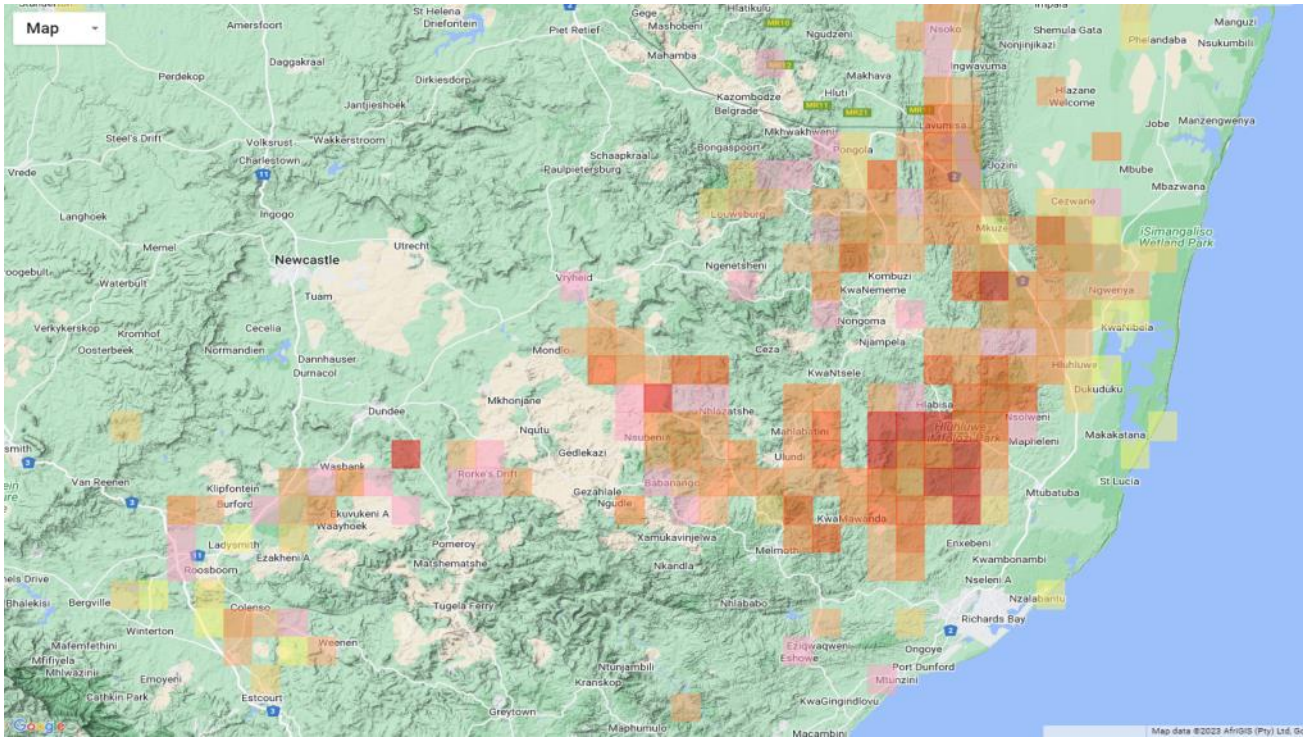

Figure 17: SABAP2 distribution map for the White-backed Vulture showing the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located.

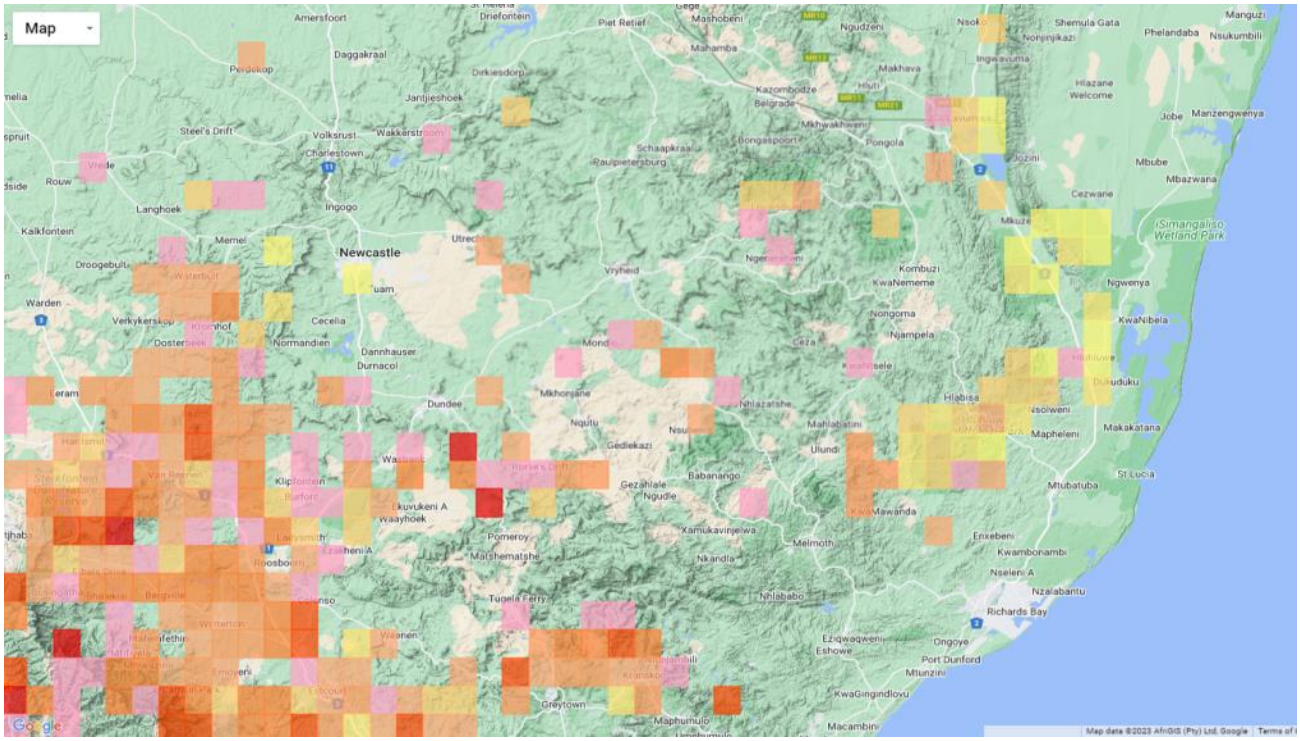

Figure 18: SABAP2 distribution map for the Cape Vulture showing the presence of this species in the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located.

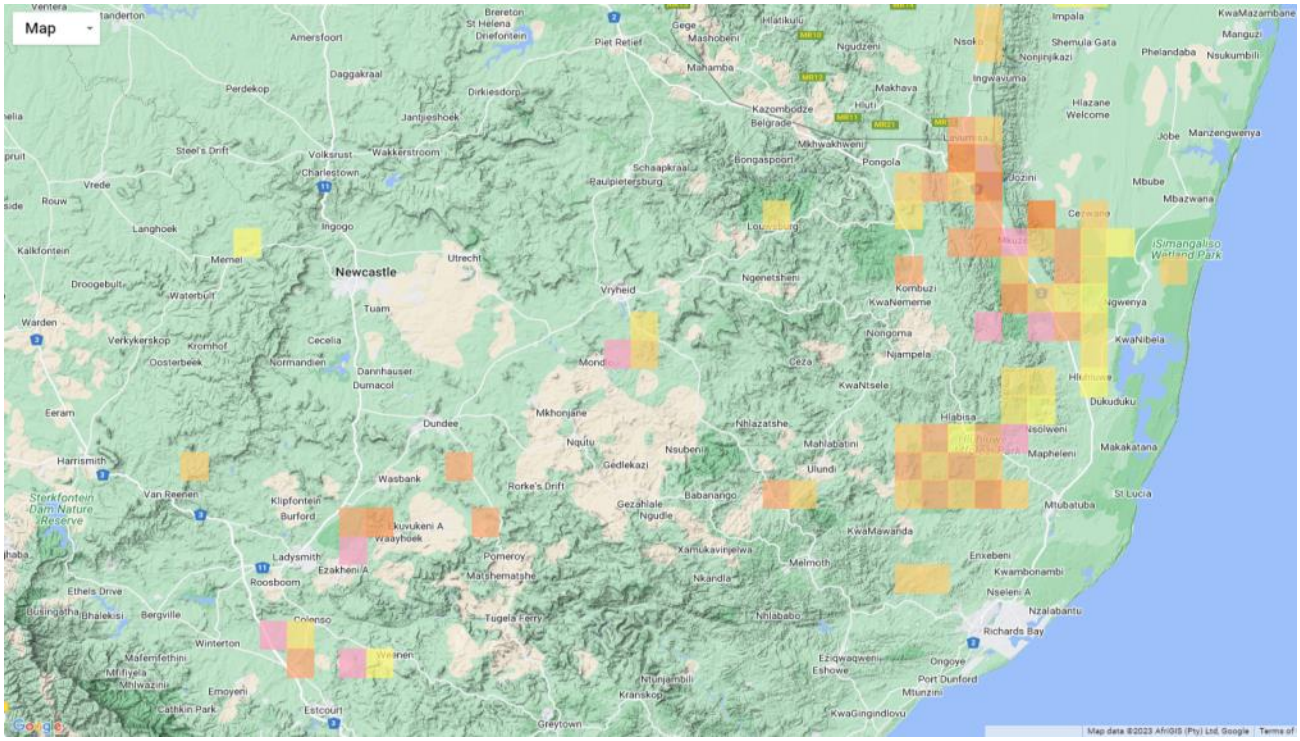

Figure 19: SABAP2 distribution map for the Lappet-faced Vulture showing some evidence for this species also utilizing the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located

5.6 Cultural Heritage Aspects of the area

5.6.1 Heritage Aspect

Stone Age: From available evidence, it seems that very little habitation of the region took place during the Early Stone Age. This change during the Middle Stone Age and some sites are known to occur to the north of the study area. Although no sites dating to the Later Stone Age are known from the larger region, some very important sites occur in the Ukhahlamba Mountains, Biggersberg and Ngome escarpment.

Iron Age: The occupation of the larger geographical area (including the study area) started during the so-called Early Iron Age and is part of the Kalundu Tradition that links with the Kwale sites of Kenya. These early sites occur almost always in the dunes of the coastal forest belt, extending inland into the lower-laying savannah areas in the vicinity of rivers - see for example the various maps in Huffman 2007).

Historic period: White settlers, under leaders such as Piet Retief and Andries Pretorius entered the region during the early 1830s, taking up land to farm. This led to competition with the local Nguni-speaking people and eventually gave rise to conflict. On 6 February 1838 a large number of white settlers camped out along the Bloukrans and Bushmans Rivers were massacred by what is commonly referred to as Zulu impis. The survivors laid out a town not far from the massacre and called it Weenen ("weeping").

Site specific review: The area in which the development of the RS tower will take place can be described as a very slowly evolving farming landscape. Change that was brought about was an expansion from grazing to larger agricultural field. Over time, the number of built features, mostly homesteads, expanded into small villages.Old maps and aerial photographs indicate that the site where the tower is to be constructed was always vacant and used as

agricultural fields. This would effectively have destroyed much of any archaeological remains that might have occurred here in the past.

5.6.2 Palaeontological overview of the area:

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

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

Fossils are generally absent from the Pietermaritzburg Formation although trace fossils have been recorded from the upper layers (AMAFA Palaeotech).

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (*Leptophloem australe*) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remains in the interbedded mudrocks as well as the diamictite itself, while anthropod trackways and fish trails are present in places on bedding planes (Visser *et al.* 1990).

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

5.7 Visual Characteristics of the area

5.7.1 Sense of Place

The sense of place is predominantly defined by the natural landscape and the simple subsistence settlements that coincide within it. The natural character is known for a homogenous landcover of savannah type vegetation with topographic variations ranging from rounded mountains to shallow drainage channels.

5.7.2 Study Area Photographic Record

As shown in **Figure 20**

- Panoramic view (1): This photograph is taken from the P700 in the direction of the proposed tower site. It illustrates the undulating plain and the distant mountains as well as the homogenous vegetation cover.
- Panoramic view (2): This photo is an enlarged view towards the proposed tower site from the P700

Panoramic view (1)

Panoramic view (2)

Figure 20:: Study Area Photographic Records

5.7.3 Viewshed Analysis

The panoramic photos illustrated in **Figure 20**, captures the landscape character of the study area. In addition, visibility mapping through a Geographical Information System (GIS) software is also done to determine a preliminary Zone of Visual Influence (ZVI). The mapping indicates the extent of the potential ZVI based on the topography alone, thereby not considering the screening effect of vegetation. It calculates a cumulative viewshed for a series of points stacked at 10m vertical intervals, on the tower location. It presents a coloured map where red indicates the areas that could experience a full view of the entire tower. The colours change as the tower is partially screened, usually from the bottom up. Only the top is visible from the green areas (**Figure 21 & Figure 22**).

The conclusion is that the study area generally provides a low screening potential inside the ZMVE and to the east, but a medium to high screening potential at greater distances from the tower site. The topography towards the east is more open and views can extend up to 10km, although in a fractured fashion. The landcover, for example the natural vegetation, do provide an additional screening capacity in specific locations. One can assume that the dense vegetation cover will increase the screening potential in certain localised areas. This is illustrated in **Figure 20** (2) which illustrates the vegetation along the P700 which screens views to from the road to the tower intermittently. The same scenario can be assumed to occur from the villages in the study area.

Interestingly, the viewshed comparison (**Figure 23**) shows marginal changes between the 85m and 65m tower heights. This confirms the low to moderate topographic variation in the study area and the limited effect of the topography on the visibility of the proposed tower, irrespective of its height.

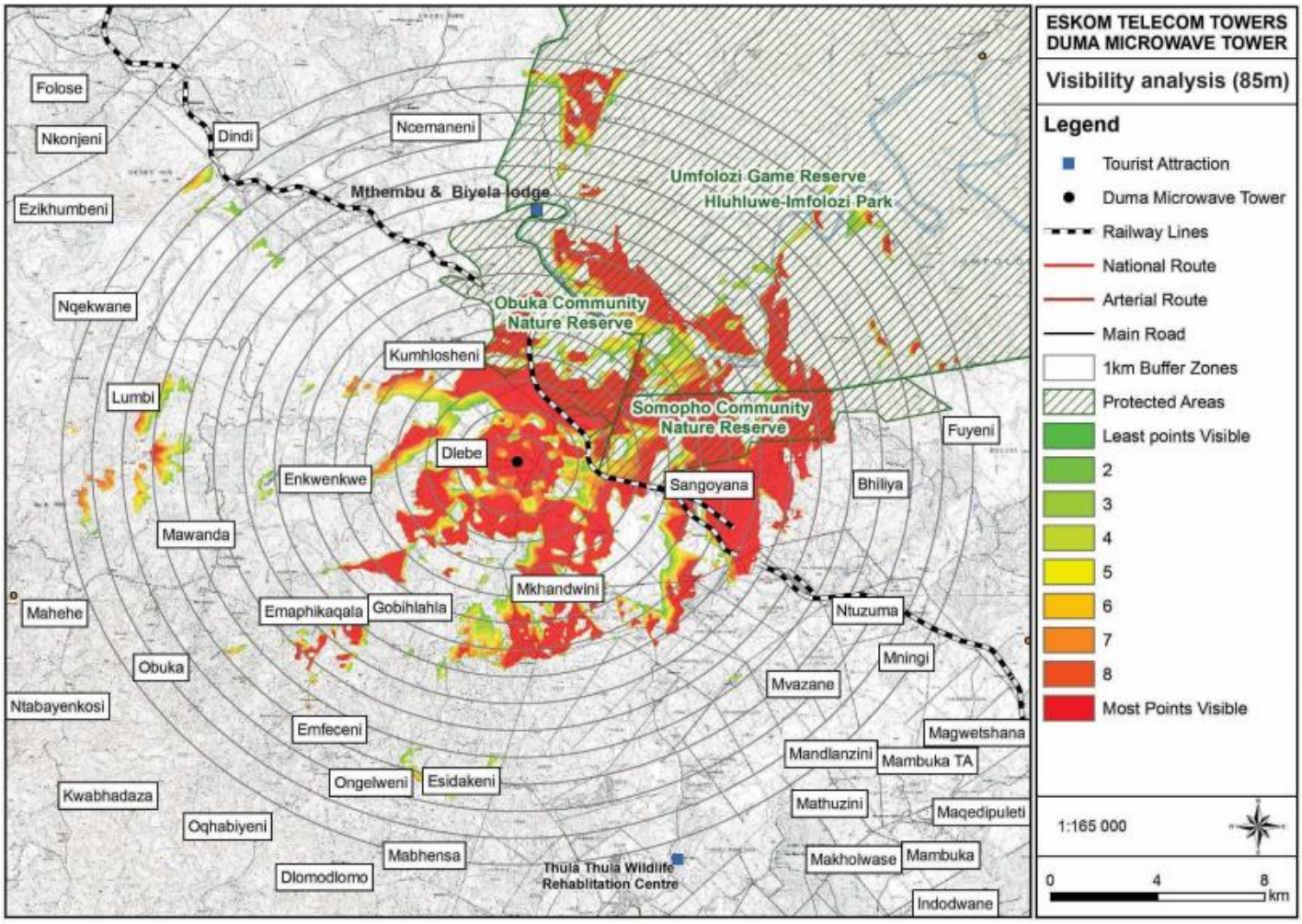

Figure 21: Cumulative viewshed map (85m)

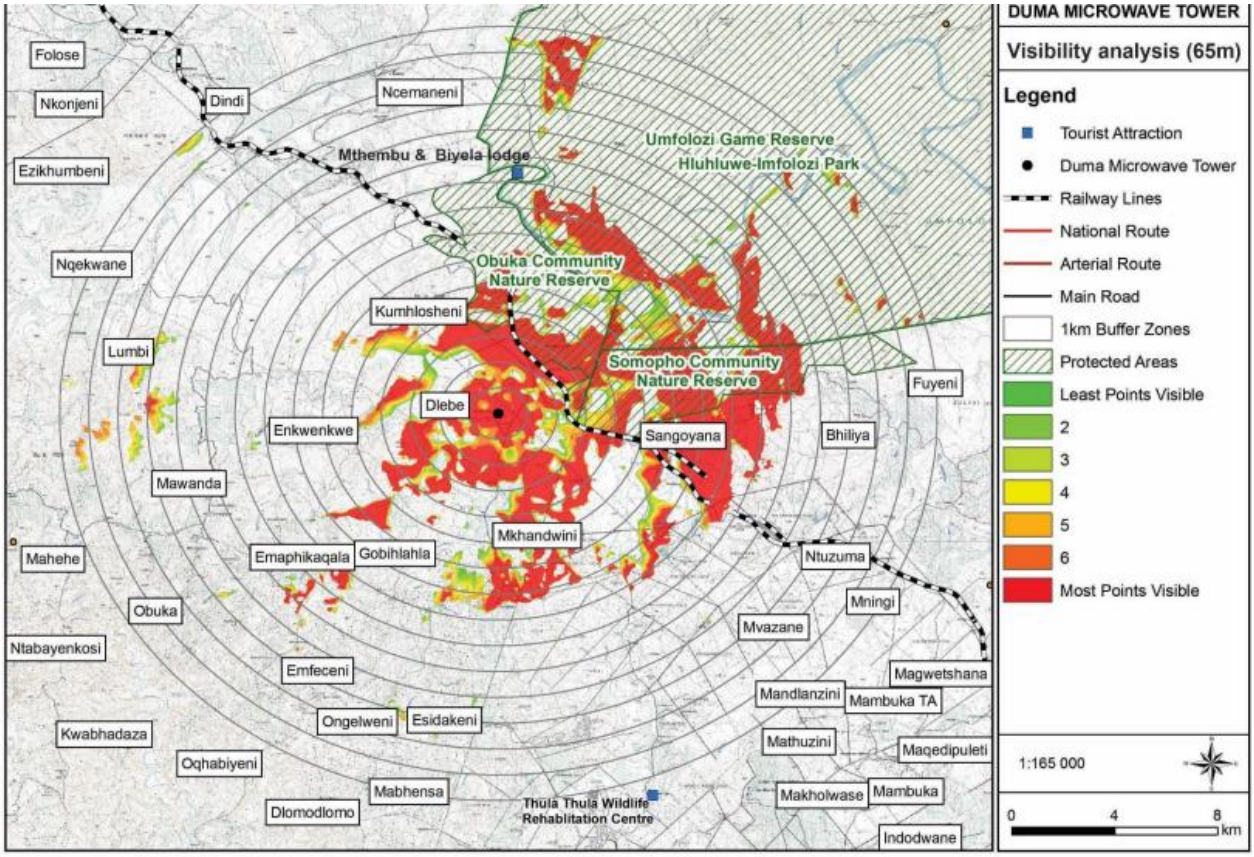

Figure 22: Cumulative viewshed map (65m)

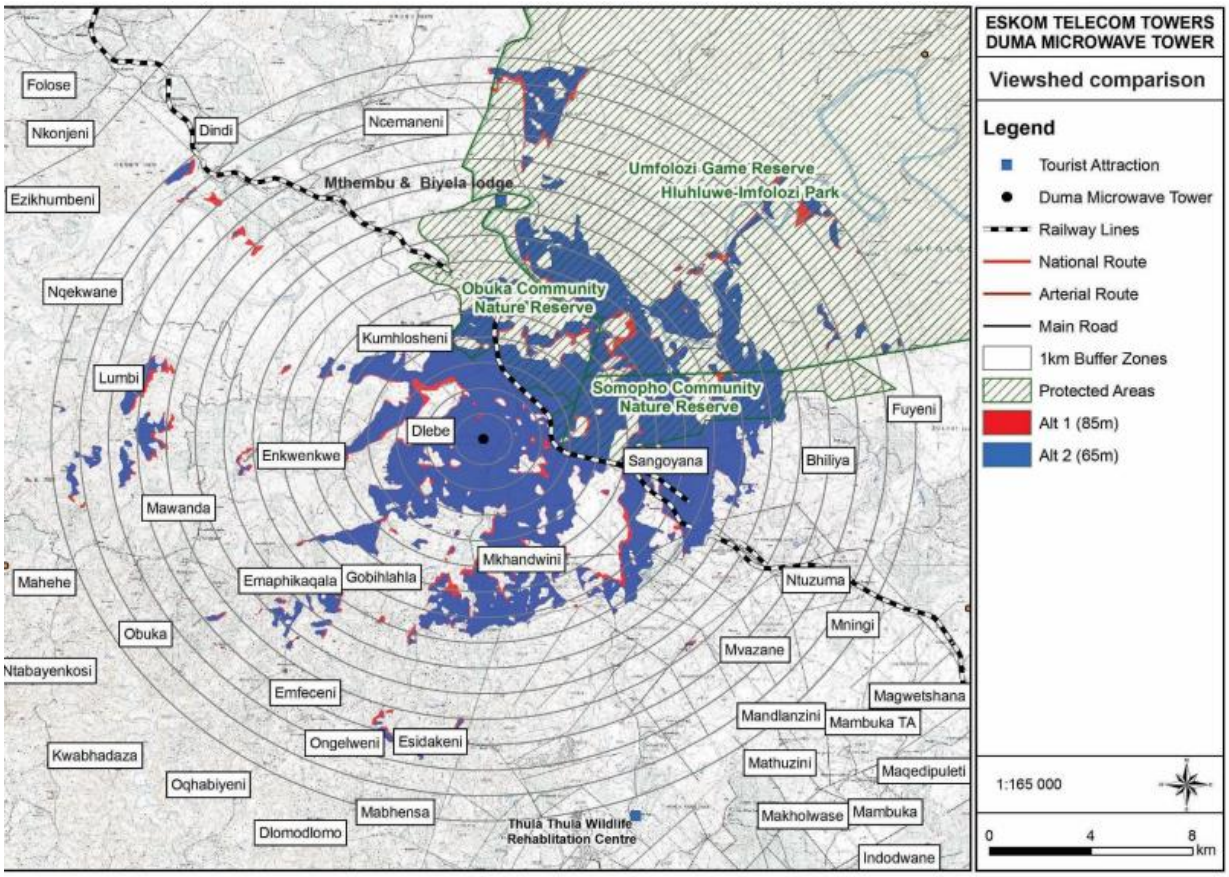

Figure 23: Viewshed comparison

5.8 Social Characteristics of the Study Area and Surrounds

Population Profile:

According to the latest census that was conducted in 2016 there was a total population of 83 563 people residing in municipal area of jurisdiction. According to the 2016 census there is an increase in the total population which is a result of the wards that were inherited from Ntambanana municipality. Males constitute 45.8% with 54.2 females. This reflects that the percentage of the females is 8.4% greater than that of the males.

Economic Profile

The 2011 statistics reflect that a large amount of people in Mthonjaneni area of jurisdiction are either unemployed or discouraged work seekers. The majority of those who are employed are low income earners. A high percentage of the households depend on government social grants as means of poverty alleviation. There is a large labour force employed by farms around Mthonjaneni and earn very low salaries.

Education Profile

The proportion of persons with no schooling is estimated at 10 623, of which most of them are from the Black African (female) population. The proportion of individuals who have attained grade 12 is approximately 8 864 across all population groups. Further it is noted that the proportion of individuals who have attained grade 12 is far much higher than the recorded statistics of tertiary education.

Household Income

Household income can be used as a proxy for economic well-being of household and individuals, as it determines their consumption and savings potentials. Changes in the income by households is one of the direct indicator available that can be used to establish who benefits from economic development and by how much are the beneficiaries benefiting. Furthermore, data on household income can be used to inform poverty analysis.

Employment

Figure 24 indicates that in all categories, with an exception of employed group, there are more females than males. The majority falls on the other not economically active and the population of discouraged work seekers does not hold a significant percentage.

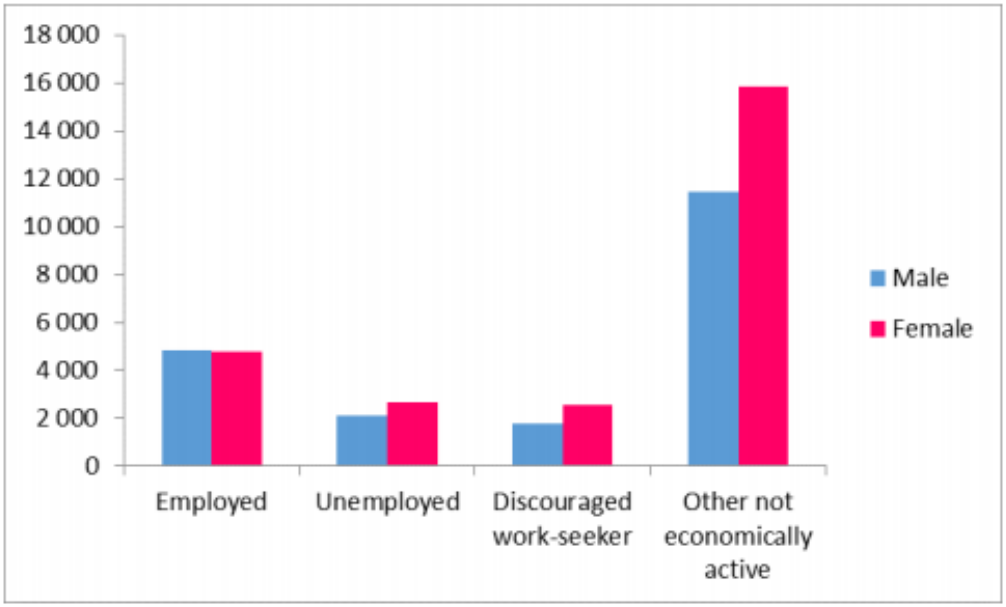

Figure 24: Employment by Gender Source: *Mthonjaneni IDP 2021-2022.*

The rate of unemployment within the municipality remains being high. In order to find employment opportunities, the economically active population has to travel to areas such as Richards Bay and Empangeni.

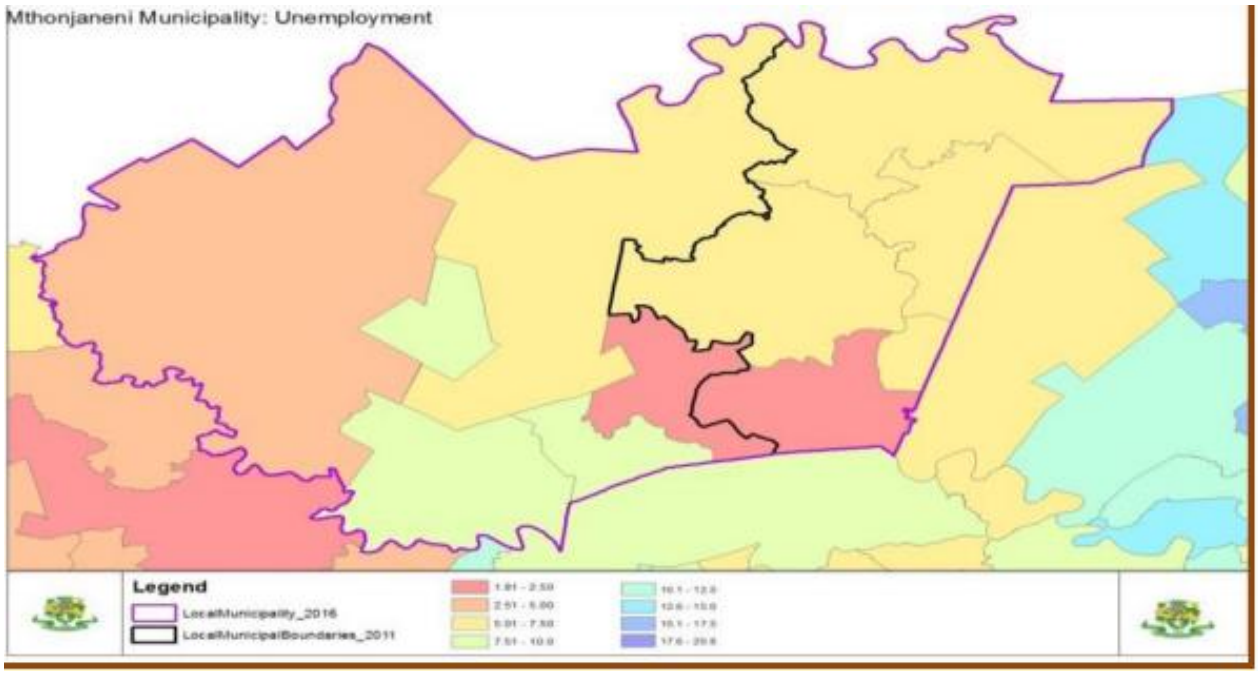

Figure 25: Showing Unemployment within the Municipality

Access to water and sanitation

Mthonjaneni Local Municipality is not the Water Service Authority. King Cetswayo municipality is a Water Service Authority and a Water Services Provider for all the areas under the Mthonjaneni Municipality. The King Cetshwayo Municipality has a duty to all consumers, or potential consumers, in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water supply and sanitation (collectively referred to as water services). As a WSA, King Cetshwayo Municipality focuses on water services and on providing at least a basic level of service to consumers in its area of jurisdiction.

6 DESCRIPTION OF POTENTIAL IMPACTS AND ISSUES

The activities that are associated with the construction, maintenance and operation of the proposed Towers, which could potentially have an impact on the environment, are also highlighted in this section. In addition, the Department of Forestry, Fisheries and Environment guide on assessing cumulative effects[2] describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

6.1 Aquatic and Wetland impacts

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E1** – Aquatic and Wetland Impact Assessment Report for more details).

Results of the Wetlands Assessment:

All the potential watercourses occurring within 500m of the tower site were mapped as shown in **Figure 26**. A total of three watercourses were identified and mapped within 500m of the site. The proximity of the identified watercourses to the tower site is summarised as follows:

- The watercourse to the north of the site is located 273m downslope of the site. The site does not drain in this direction.
- The watercourse to the east of the site is located 222m downslope of the site.
- The dam to the east of the site is located 465m of the site. The site does not drain in this direction

Considering the large distance between the tower site and the three watercourses and the very small impact footprint of the tower project, the likelihood of impact ratings for each of the watercourses were screened as follows:

- The watercourse to the north – **unlikely**.
- The watercourse to the east – **unlikely**.
- The dam to the east – **none**.

This means that the project stands to have no measurable impacts on the local watercourses. For this reason, the assessment approach was to undertake site visits to confirm and verify the location of the watercourses and the above impact screening results. Formal delineation and PES, ecosystem services and EIS assessments were not undertaken.

[2] *DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria*.

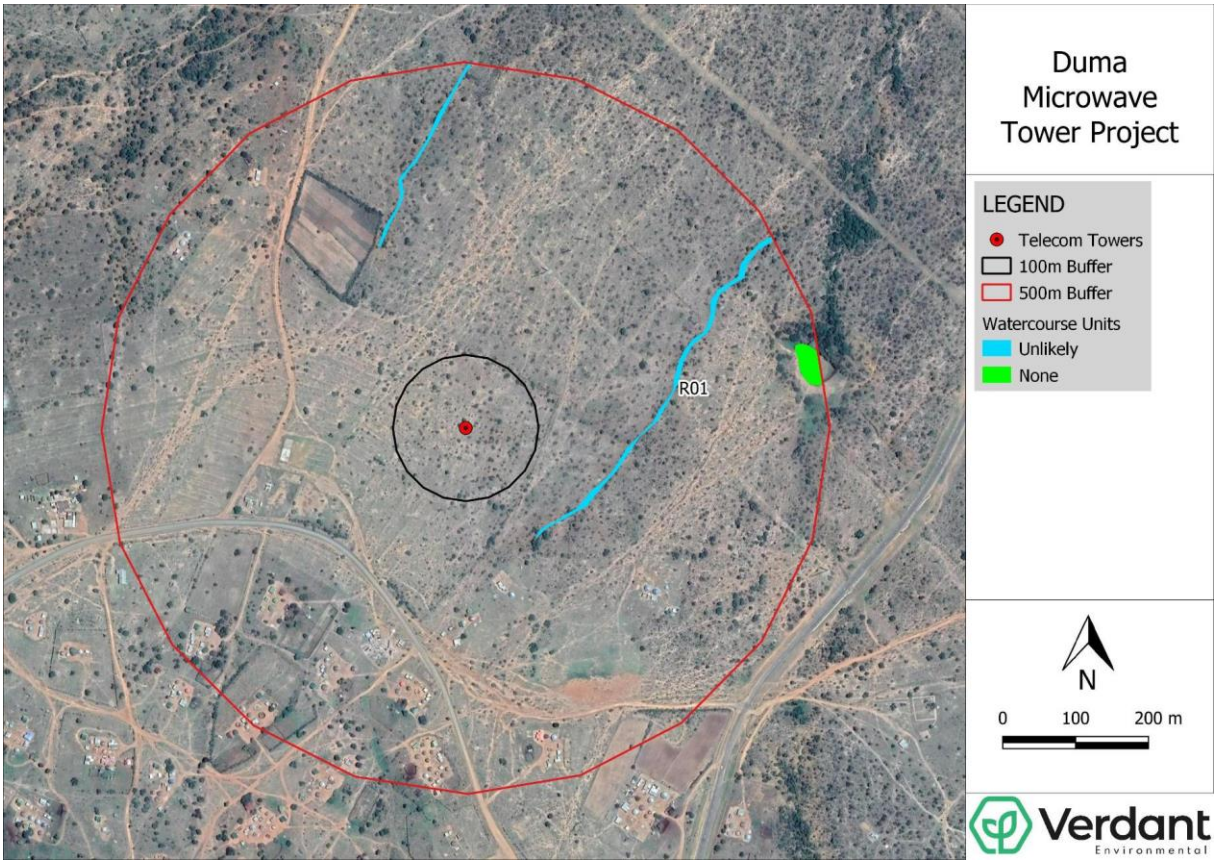

Figure 26: Watercourses within 500m of the project activities with an indication of the likelihood of impact.

The watercourses within 500m of the project are unlikely to be impacted. Therefore, the risk will be negligible. Nevertheless, in line with the requirements of the Department of Water and Sanitation (DWS), a risk assessment has been done to formally confirm the low risk status of the project

6.2 Terrestrial Biodiversity

6.2.1 Vegetation

Results of the Vegetation Study: The Duma Microwave Tower is surrounded by grazed or browsed Zululand Lowveld vegetation which is quite open. The habitat appears to contain a number of *stapeliads* (two species of *Huernia* and at a little further distance *Stapelia gigantea*). In addition, there is one uncommonly encountered *Ceropegia (C. crassifolia*) and the succulent *Euphorbia knuthii.* All of these are protected. As a result, although degraded, **the site is rated of moderate importance and sensitivity**.

Description of Impacts:

For the purposes of this assessment, the potential impacts to the terrestrial flora and local terrestrial biodiversity resulting from the proposed activities can be grouped into the following impact categories:

- **Direct ecosystem destruction and modification impacts** – This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.

- **Indirect ecosystem disturbance impacts** – This impact refers to the indirect impacts to the biota and vegetation communities as a result of activities within close proximity that result in the following impacts: (i) alteration of abiotic soil and moisture conditions, (ii) increased rates of erosion and sedimentation, (iii) alteration of the chemical and biological characteristics of soil and water, (iv) increased alien invasive plant invasion, (v) noise pollution, (v) vibrations and (vi) light pollution, and (vii) expanded edge effect.

Impact Significance Assessment

- Impacts to terrestrial vegetation communities and habitat:

The direct physical impact of the tower will be small in relation to the greater Zululand Lowveld communities and patches. Furthermore, there are numerous cattle and human paths throughout the study area that could be used for the access road alignment to reduce impacts and the vegetation is degraded due to intensive overgrazing and lack of management. Therefore, impacts to Zululand Lowveld vegetation will be localised and small. For these reasons, the significance was assessed as being **moderately-low** and generally acceptable under a poor mitigation scenario. This rating was largely driven by the 'site' extent, 'moderate' impact intensity and 'definite' probability of disturbance. The moderate intensity is driven by the direct impacts to some small areas of vegetation that is of moderate importance and has an 'Vulnerable' provincial threat status. Under a realistic **good mitigation scenario** where the tower footprint design minimises the direct disturbance footprint and where the construction of the tower is carefully planned to minimize direct impacts within the vegetation, the **significance was assessed as being low** and acceptable.

- Impacts to local and regional landscape ecological processes:

Under both a realistic poor and good mitigation scenario, the significance of Impact was assessed as **being low and generally acceptable**. This is because the degree of ecosystem fragmentation and impacts to existing levels of ecological connectivity will be negligible due to the small and localised physical on the ground impacts to vegetation and habitat as a result of the tower and access/ service road establishment.

6.2.2 Fauna

Results of the Faunal Study: Based on the habitat and terrestrial fauna species at the Duma microwave tower, the site can be classified as being of **medium importance and sensitivity**.

Description of Faunal Impacts:

This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.

Impact Significance Assessment

- Impacts to terrestrial biota / species:

A relatively high number of protected plants were identified during the site survey. However, none of these plants are threatened and red listed and/or rare. Therefore, although some of these plants will likely need to be relocated and some may die, the impacts on plant species conservation will be low. In terms of fauna, limited onsite habitat and evidence for threatened fauna species was found. Some threatened fauna may frequent and

move through the site from time to time. It is also important to note that the direct physical impact of the tower will be small in relation to the greater lowveld habitat and there are already corridors of disturbance that can be used for site access.

For these reasons, the **significance of Impact was assessed as being moderately-low** and generally acceptable under a poor mitigation scenario. This rating was largely driven by the 'site' extent, 'moderate' impact intensity and 'definite' probability of disturbance. The moderate intensity is driven by the potential direct impacts to protected plant species identified. Also, with the exception of sedentary and slow moving species (e.g. millipedes, molluscs and chameleons), most fauna species are also able to move away from disturbance and avoid fatalities.

Under a realistic **good mitigation scenario** where the location of towers and access / service roads are carefully planned and the footprints within the terrestrial habitats are minimised as far as possible, the **significance of Impact** was assessed as **being low and acceptable.**

6.3 Avifauna

6.3.1 Results of the avifaunal Study As the tower is located relatively close to the Hluhluwe-iMfolozi Game Reserve Park (HiP), several threatened species have been recorded in the local area and were rated as having a possible likelihood of occurrence, namely:

- White-backed Vulture (Critically Endangered)
- White-headed Vulture (Critically Endangered)
- Lappet-faced Vulture (Endangered)
- Martial Eagle (Vulnerable)
- Bateleur (Vulnerable)
- Tawny Eagle (Vulnerable)
- Ground Hornbill (Endangered)

6.3.2 Description of Avifaunal Impacts:

The potential threat to birds stemming from collisions with telecommunication-tower infrastructure lies within the broader problem of bird collisions with elevated anthropogenic structures generally (Kerlinger 2000, Anderson 2003, Erickson et al. 2005). This issue has achieved greatest prominence relevant to collisions with overhead electricity power transmission and distribution lines (Bernardino et al. 2018) and, more recently, with the blades of wind turbines (Drewitt & Langston 2008). The problem however extends to elevated structures generally, e.g. cables associated with telephone lines, cable-cars, ski-lifts, zip-lines, fence-lines, etc., and buildings, particularly those with bright night lighting and reflective glass windows, especially tall skyscrapers.

> ***Avian vision relevant to collisions:*** Structures that seem clearly visible and hence avoidable under typical calm-weather daylight conditions, may become far less visible or at least avoidable by birds flying under conditions of poor visibility, e.g. at night or dusk/dawn, when flying into the direction of the sun which negatively effects forward vision, in conditions associated with rain, mist, fog, or low-hanging cloud, and under strong wind conditions, as well as when being pursued or otherwise distracted by other avian predators, competitors, while searching for food, indulging in territorial display flights, etc. (Benson & Dobbs 1984, Anderson 2003, Drewitt & Langston 2008). There is also now clear evidence that

elevated structures that would seem obvious to the human eye are easily overlooked by some bird species, including vultures, in flight due to factors such as eye placement and hence field of view, as well as the direction in which some birds typically direct their view (often downwards and to the side rather than to the front) based on an ancestral evolutionary scenario that totally lacked the types of dangerous elevated anthropogenic structures that now populate landscapes (Martin et al. 2012). An aerial cable is also likely to be more visible when seen from the typical human position, i.e. from below and against the open sky, compared with the view of a flying bird, where the cable may be viewed from above or the side and against the ground and hence far less contrasting (Benson & Dobbs 1984)

Collisions by nocturnal migrants with telecommunication-tower infrastructure: Relevant to telecommunications towers, the primary avian concerns have related to mortality ('towerkill') of nocturnal migrants (typically passerines/songbirds) associated with these structures (Kerlinger 2000, Anderson 2003, Erickson et al. 2005, Drewitt & Langston 2008, Gehring et al. 2011, Lundstrom et al. 2013). The issue has received most attention in North America. The worst-case scenarios of mass mortality seem associated with such nocturnal migrants becoming 'trapped' within the (typically aviation) lighting characteristic of these structures. This results in the birds fluttering around the tower either succumbing to collisions with the tower infrastructure, especially any lateral support cables but also sometimes the structures themselves, or to exhaustion, predation, etc. The situation is particularly aggravated during (indeed apparently largely restricted to) misty/foggy conditions, when the birds tend to fly lower and are more vulnerable to the light attraction and trapping effects. Wind direction may also be implicated in some circumstances, as well as phases of the moon. Tower elevation is also highly relevant (with those less than about 150 m in height rarely being problematic), with the problem disproportionately worsening with increasing tower height, bearing in mind also that telecommunication towers are typically located on the highest points in the landscape effectively raising their actual height above the primary surrounding landscape. Tower lighting, usually mandatory due to civil aviation requirements, seems a critical component of this problem, attracting and trapping the birds to within the illuminated area. Constant lighting seems worst, especially where red lighting is employed, with flashing lights being less problematic and the longer the time periods between the flashes the better (Drewitt & Langston 2008, Gehring et al. 2009).

Unlike the situation in temperate North America however, the sub-tropical South African avifauna is not dominated by migratory species to anywhere near the same extent. In particular, South Africa lies largely at the end point of the migrations of the migratory birds visiting the region from further north and hence unlikely to support the extensive migratory pathways and bottlenecks characteristic of other global regions more centrally situated relevant to avian migratory routes. Indeed, such problems of mass mortality at telecommunication-tower infrastructure by nocturnally migrating birds appear not to have been reported in South Africa.

Collisions by large diurnal birds with telecommunication-tower infrastructure: In contrast to the apparent position relative to small avian nocturnal migrants, telecommunication-tower infrastructure in South Africa can pose a real collision threat to large diurnal birds in flight. This issue is of especial concern as the construction of communication towers has increased exponentially worldwide (Anderson

2003, Erickson et al. 2005), including in South Africa. The vulnerability of these birds, including birds of prey such as eagles and vultures, to collisions with elevated structures is widely appreciated, especially as relevant to overhead electricity cables (Bernardino et al. 2018) but the general principle extends to all overhead cabling.

Telecommunication towers are typically placed on high points in the landscape, usually associated with mountain- and hill-tops, and long the edges of tall escarpments, in order to maximize transmission distances. Large flying birds, especially soaring species, are also typically attracted to such sites due the advantages they provide in terms of providing lift in flight associated with wind patterns around these elevated areas (e.g. Khoury 2017). This increases the vulnerability of large flying birds to collisions with infrastructure associated with these towers. This situation is very similar to that relevant to wind turbines which are also typically placed in elevated positions to take advantage of enhanced wind conditions at such sites, and which similarly increases the danger of collisions of large flying birds with the turbine blades. It should be emphasised that diurnally flying birds are vulnerable to collisions not only with overhead cables and moving wind-turbine blades but also with elevated wind towers themselves as tall structures in potentially sensitive locations (Choi et al. 2020).

Strong headwinds and low cloud ceilings tend to force birds to fly at lower heights and hence be more susceptible to collisions with structures such as communication towers, and air temperature and humidity also effect flight height (Drewitt & Langston 2008). Soaring raptors typically fly at lower heights during cool compared with hot weather (Khoury 2017).

Drewitt & Langston (2008) provide specific recommendations relevant to communication towers to minimize the danger of bird collisions:

- the construction of towers should be avoided in area characterised by regular low cloud or mist/fog,
- the construction of towers should also be avoided in areas which support appreciable populations of threatened birds vulnerable to collisions with the infrastructure associated with such towers,
- towers should be clustered as close to one another as possible in discrete ‘tower farms’,
- as far as possible, new communication equipment should be co-located on existing towers, even if owned by other entities,
- towers should be kept to below about 60 m in height,
- towers should comprise tubular monopoles similar to those used in modern wind turbines, rather than being lattice structures,
- lateral support cables should not be used, and
- where lateral support cables are present, these should carry clear marking devices, especially in areas inhabited by birds of prey (see also Bernardino et al. 2019).

The best documented case of mass mortality to vultures at a South African tower site relates to 55 Cape Vultures reported as having died in collisions with the lateral support cables of a particularly tall (235 m) radio and television transmission tower operated by the South African Broadcasting Service (SABC)/Sentach (Benson & Dobbs 1984). This tower is situated on the summit of a peak in the Waterberg Mountains in Limpopo Province, within the Marakele National Park. The tower locality is

situated in close proximity and directly above one of the two largest colonial breeding colonies of the Cape Vultures on cliff faces situated below the tower. The high mortality is related to this proximity of the tower to, and situated above, the colony. Young, recently fledged and inexperienced vultures are particularly vulnerable to these collisions. The lateral support cables of the tower have been marked to render them more visible but the problem persists, e.g. seven dead Cape Vulture collision victims were found during a search on 14 December 2012.

Other interactions of large birds with telecommunication-tower infrastructure: Large birds are regularly attracted to tall structures such as telecommunication towers as attractive perches and even as nest sites (e.g. Washburn 2014). As local examples, Pied Crows nest extensively on cellular communication towers (Senoge & Downs 2023) and Verreaux's Eagles nest on microwave towers on hilltops in the Northern Cape Province (Anderson 2000). These structures may thus be of some benefit to these birds as perches and nest sites but this attraction to these sites also increases the risk of collisions with the tower infrastructure.

Use of the structures for perching and nesting can also cause problems to the tower communication, electrical and other components through the accumulated droppings of the birds and the placement of nesting material, which can include lengths of metal wiring, on the structure (Washburn 2014). These issues and conflicts are particularly well known relevant to electricity pylons, substations and other electrical infrastructure. It follows that all electrical components incorporated in telecommunication-tower infrastructure should be comprehensively insulated to avoid potential electrocution risks with associated bird mortality and potential communication-component failures (Kerlinger 2000). The use of tubular monopoles as opposed to lattice structures largely or totally eliminates the attractiveness of such structures to perching or nesting large birds (Saidur et al. 2011).

Electricity pylons servicing telecommunication towers: Telecommunication towers typically require electrical power facilitated by electrical poles and associated overhead electrical cables routed to these sites. As alluded to above, these can also pose collision and electrocution risks to birds, particularly large species (Bernardino et al. 2018). These potential problems are likely to be particularly acute due to the remote and elevated situation of these sites, which, as mentioned above, are likely to attract disproportionately large numbers of such birds, including formally threatened species. It is therefore essential to pay conservation attention to this issue as well in the planning of telecommunication towers. This is similar to the situation relevant to wind and solar farms, which also require pylons connecting these facilities to the electrical grid and which thus need also to be included in the assessment and planning for such facilities (Ledec et al. 2011).

The powerlines servicing the tower should be of a 'bird-friendly' nature to eliminate or at least reduce by the maximum extent possible all dangers from collisions and electrocution (Bernardino et al. 2018). The relevant mitigation measures include careful routing of the powerlines to the site to avoid vulnerable areas, marking of the lines to render them of maximum visibility to birds using 'bird flappers' or bird 'spirals'/'pigtails' (Bernardino et al. 2019), and configuring/insulating the electrical infrastructure against electrocution risk (e.g. by deploying 'raptor-protector devices on particular power-pole configurations).

These measures should be implemented proactively as they are typically far more expensive to ameliorate post-construction. In particularly vulnerable areas, consideration should be given to burying power lines approaching tower sites (although this is typically expensive).

6.4 Cultural Heritage Aspects of the area

Results of the Heritage Study: During the physical survey, the following sites, features and objects of cultural significance were identified in the study area).

- Stone Age: • No sites, features or objects of cultural significance dating to the Stone Age were identified in the study area.
- Iron Age: • No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.
- Historic period: • No sites, features or objects of cultural significance dating to the historic period were identified in the study area.

Results of the Paleo Study

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

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

Table 6: Taken from Palaeotechnical Report (Groenewald 2012) (**1cA)**.

Volksrust (Pvo)		Dark Grey Shale	Trace Fossils
Vryheid (Pv)		Light grey coarse- to fine-grained sandstone and siltstone. Dark coloured siltstone due to presence of carbon enrichment and coal beds	Abundant plant fossils of *Glossopteris* and other plants. Trace fossils. The reptile *Mesosaurus* has been found in the southern part of the Karoo Basin
Pietermaritzburg (Pp)		Dark Grey Shale	Trace Fossils
Dwyka (C-Pd / Pd)		Tillite, diamictite	None recorded in KwaZulu-Natal to date. the basin

Table 7: Criteria used (Fossil Heritage Layer Browser/SAHRA) **(1cB)**:

Rock Unit	Significance/vulnerability	Recommended Action
Vryheid Formation	**Very High**	Field assessment and protocol for finds is required
Pietermaritburg F	**Moderate/ Orange**	Desktop survey and Phase 1 PIA is recommended
Dwyka Group	**Moderate/ Orange**	Desktop survey and Phase 1 PIA is recommended

Impact: **MODERATE**, **VERY HIGH** for the Dwyka Group, Pietermaritzburg Formation, and Vryheid Formation, Karoo Supergroup. There are significant fossil resources that may be impacted by the development (mudstone, shale) and if destroyed are no longer available for scientific research or other public good (Almond, *et al.* 2009).

The palaeontological sensitivity is as stated above and here in colour for the Option:
An area outlined in red balloons for the **radio towers**, power lines in green (south) and red (north) close to Paulpietersberg, Vryheid, Louwsburg and Ulundi. The approximate size of the towers ranges from 16 and 30 m^2.

- 3 x Ulundi Telecomms towers present on the Dwyka Group.

All the land involved in the development was assessed **(ni,nii)** and none of the property is unsuitable for development. **Fossils are generally absent from the Pietermaritzburg Formation although trace fossils have been recorded from the upper layers (AMAFA Palaeotech).**

The threats are: -

- Earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction,
- The sealing-in or destruction of fossils by development, vehicle traffic, and human disturbance. See Description of the Geological Setting (F) above.

6.5 Visual Impact

6.5.1 Sensitivity **of observers:** The following observer groups have been identified in the study area:

- Residents; and
- Motorists utilising the local road network.

Residents in the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. The highest concentration residents are located west and south of the proposed tower site and forms part of the Debe rural settlement. These residents will be within the ZMVE and will experience full views of the proposed tower.
The rural settlement of Emkhandlwini is located 6km south of the tower site and is outside the ZMVE. Their exposure to the potential visual impacts will be much reduced due to their distance from the source of impact and their sensitivity is expected to be medium. Motorists are considered the least sensitive group of observers due to the speed at which they travel and their brief exposure to impacts. This group is mostly limited to road users on the P700 which, at its closest point, will pass within 0.5km from the tower site. Intermitted views of the proposed tower are expected as motorists travel through the study area.

Tourists are considered to travel periodically through the area but at a very low frequency as the site is not near any major tourist attractions. The Opathe Game Reserve and HiP are west and north of the tower site respectively, but main entrances and overnight accommodation are located outside of the study area. The only exception is the mFulaWozi Wilderness Private Game Reserve featuring the Mthembu & Biyela lodges approximately 9 km north of the tower site. The exclusive reserve is located next to the White Mofolozi River, and

its low laying location will be screened from the tower. In addition, the reserve is on the outer edge of the visual detection range and visual exposure is considered negligible.

It is worth mentioning that the UBEN strategy is poised to attract more tourists to the area and that more development may be expected in future. However, there is no certainty as to which areas will see development and what timeframes will be followed. Up until then, the conclusion is that the area does not offer any tourist attraction or destination at the moment, near the tower site.

6.5.2 Sensitivity **of the Landscape Character:**

The study area is considered to have a medium VAC. The topography will contain visibility of the tower to approximately 5km towards the north and west, and 6km towards the south. The topography towards the east is more open and views extend past 9 km, although in a fractured fashion. The limits of detection is at 7-9 km depending on the height of the tower, but atmospheric haze and background conditions are expected to limit detection at closer distances.

The natural vegetation is expected to contribute to the VAC by increasing the screening capacity of the landscape in some specific locations. The vegetation is expected to have more of an effect during the construction phase, when construction activities occur on ground level. Once the tower is completed, its physical height will result in minimal screening from vegetation within the ZMVE. At further distance, in conjunction with the varied topography, the screening capacity may increase.

A medium degree of inter-visibility between adjacent landscapes are expected due to the location of the tower and its overall height when completed. This is also confirmed via the viewshed analyses. The reduced visibility of objects over distance, will also reduce the degree of inter-visibility.

Towers or masts are relatively familiar objects in the South African landscape. For example, cellular towers are dotted across the rural and urban landscapes and have a resemblance to the proposed telecommunication radio tower with regards to its visual characteristics. The proposed tower will be placed as a single tower in a landscape that has no exact analogous structures in its proximity. The tower will have a similar proportional scale to the existing transmission line towers, except for being slimmer in design and taller. It will have a similar industrial character as the Duma substation and transmission lines, therefore compatible with the site's character, but contrasting with the overall natural-rural setting found in the study area. It also conflicts with what the UBEN is attempting to achieve.

The landscape character sensitivity is considered medium and is attributed to the generally undeveloped nature of the majority of the study area and the natural vegetation cover that is largely intact, although partially transformed in and around the settlements. The tower site i.e., within the future Duma Substation next to the existing transmission lines, is transformed thereby influencing the sensitivity of the landscape character at that location. The general scenic quality is considered pleasant, although not unique within its context. High value landscape attributes are few and mostly limited to the elevated terrain and deeper river canyons in the far northern and western parts of the study area.

6.6 Agricultural Potential Impact

Although, the area has high potential for agriculture based on the classification indicated in **Figure 8,** the agricultural value of the area is low due to lack of commercial agricultural productivity in the area.

Therefore, based on the fact that the site area has low agricultural productivity level, the land can be utilized for the proposed Duma Tower construction. The area required (900 m²) for constructing the tower will not have significant impact on the area available for agriculture. The area required (300 m) for constructing the tower will not have significant impact on the area available for agriculture.

The spatial extent (approximately 900m2 per site) of the impact regarding loss of agricultural land is limited to the project area (2) and with mitigation can be reduced to the smallest rating (1). The severity of loss of agricultural land without mitigation is medium (4); however, with mitigation the impacts can be reduced significantly (2). The duration of the impact if unmitigated is long lasting (4), and with mitigation this can be reduced to a medium impact timeframe (3). The significance of the land resource being lost is medium (20), and with mitigation at low impact (12). The impact is of great importance. Failure to mitigate with the objective of reducing the impact to acceptable levels could render the entire project option or entire project proposal unacceptable. Mitigation is therefore essential. The identified project sites are currently not under cultivation; hence the impact of the project is low. However, during construction if cultivated areas are encountered, irrigated fields should be avoided.

6.7 Social environment Impacts

The following impacts are identified as the major impacts associated with the development of the project the construction and operational phases of the development.

- Inflow of Workforce and Jobseekers
- Employment Opportunities and Local Procurement
- Impact on Sense of Place
- Impact on Tourism:

6.8 Assumptions, uncertainties, and gaps in knowledge of the study

A number of limitations and assumptions, as described below, are noted for this environmental impact assessment.

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on human perceptions. It is the visual specialist's aim to utilise as much quantitative data and scientific research as possible, to substantiate professional judgement and to motivate subjective opinions
- The realistic poor mitigatiom,…n scenario assumes the following:
    - The tower location as currently planned will be implemented.
    - Access and haulage roads during the construction phase will be poorly planned and regulated.
    - All towers will be established outside of river and wetland units and a 30m buffer zone.
- The realistic good mitigation scenario assumes the following:
    - All the planning and design measures recommended will be adhered to.

7 ASSESSMENT OF POTENTIAL IMPACTS

7.1 Assessment of alternatives

The following alternatives have been considered and assessed through this EIA report.

- **Design/Layout alternative**: Two tower designs are considered for this project (i.e. Lattice vs Monopole structure).

The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects are considered. The details pertaining to each alternative considered, as well as the technical preference are provided below:

The potential impacts discussed in the impact tables in this section are relevant for the tower design considered for this project (ie Lattice vs Monopole structure) for the majority part as these alternatives considered do not differ considerably in their significance as far as Environmental Impacts are concerned. Therefore, in most part of this section the assessment tables the alternatives are not comparatively assessed however where applicable, the differences are highlighted in red.

7.2 Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so
that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

The impact assessment methodology has been aligned with the requirements for BA Reports as stipulated in Appendix 1 (3) (1) (j) of the 2014 NEMA EIA Regulations (as amended), which states the following:

"A BA Report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include 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 mitigated".

As per the DEAT Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- **Cumulative impacts** are impacting that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. therefore, assuming worst case scenario.

In addition to the above, the impact assessment methodology includes the following aspects whereby the significance of the impact is calculated as follows and rating significance is explained below.

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

- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

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

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

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

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

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

7.3 Impact Assessment

The specialist findings presented in this section represents a summary of the detailed and original specialist studies contained in the relevant appendices to this report **(Appendices E1 to E6).** The current summary of specialist findings is provided in the interest of brevity and with a view to facilitating public participation; as contemplated in the NEMA principles. The Competent Authority, with its mandate of substantive review of the EIA report, is therefore urged to also read the original specialist studies in the relevant appendices to this report with the aim of discharging its decision-making function. *Should any discrepancy occur between this summary, and the relevant detailed specialist study; the detailed specialist study will prevail.*

The tables below for each field of study are impacts for **line deviations**. In some instances, where there is an impact specific to one of the lines deviation, this will be stipulated in **red.** Cumulative impacts have been discussed in each sub-section below for the respective field of study.

7.3.1 Aquatic and Wetland Impact Assessment.

NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants **Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow. **Activity**: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the residential development. ***Residual Risks: Considered to be low given that optimal design is followed***	**LOW**	• Stormwater generated by the upgraded and new roads should be discharged at regular intervals and many small outlets should be favoured over few large. • Stormwater outlets must not be established within wetlands or riparian zones. • As far as practically possible, stormwater conveyance should be via open drains rather than pipes and conveyance from the road drains to the outlets should via open drains with vegetated or rough surfaces that are armoured with erosion protection. • All outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy for gravel roads will need to be installed at appropriate locations. • All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.	**LOW**
OPERATIONALPHASE IMPACTS			
Impact 1: Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants **Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow.	**LOW**	• Wherever possible, existing vegetation cover on the development site should be maintained during the construction phase. The unnecessary removal of groundcover from slopes must be prevented, especially on steep slopes which will not be developed. • Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Activity: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the residential development. ***Residual Risks: Considered to be low given that optimal design is followed***		• All bare slopes and surfaces to be exposed to the elements during clearing and earthworks must be protected against erosion using rows of hay-bales, sandbags and/or silt fences aligned along the contours and spaced at regular intervals (e.g. every 2m) to break the energy of surface flows. • Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. • If re-vegetation of exposed surfaces cannot be established immediately due to phasing issues, temporary erosion and sediment control measures must be maintained until such a time that re-vegetation can commence. • All temporary erosion and sediment control measures must be monitored for the duration of the construction phase and repaired immediately when damaged. All temporary erosion and sediment control structures must only be removed once vegetation cover has successfully recolonised the affected areas. • After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gulley for additional protection until vegetation has re-colonised the rehabilitated area.	

7.3.2 **Terrestrial Ecological: Impact Assessment**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 1: Impacts to terrestrial vegetation communities and habitat: Destruction and modification of the Zululand Lowveld habitat **Nature:** Soil and vegetation clearing and landcover disturbance during construction for • Tower establishment. • Accidental direct impacts by heavy machinery during construction i.e. poorly planned access roads. • Mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Residual Impacts:** • Erosion and/or sedimentation of Zululand Lowveld grassland • Pollution of Zululand Lowveld grassland	**MODERATE-LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** **Tower Location and Design Recommendations** • The footprint of the tower must be minimised as far as practically possible If **possible**, no lights must be established on the towers. If not possible for legitimate aviation safety or other reasons then mitigations in 7.1.1of Appendix 2 is application. **Tower Access and Service Roads** **Service Road Stormwater Management** **Tower Access and Haulage Roads** **Threatened and Protected Plant Search and Rescue** Prior to construction commencing, the following must be undertaken: • The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads, including Ceropegia crassifolia*. • Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented. **Demarcation of 'No-Go' areas and construction corridors** • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and **demarcated** using brightly coloured shade cloth: o Outer edge of all outcrops within 30m of the tower footprint, construction area and access / service roads. o The outer edges of the entire construction corridor / right-of-way. The outer edges of the entire construction corridor / right-of-way.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Impacts to terrestrial biota / species (flora and fauna): Fauna displacement and/or flora and fauna fatalities **Nature:** Establishment of Tower establishment, Access road and Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads **Residual Impacts:** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Zululand Lowveld • Flora and fauna stress and/or fatalities as a result of pollution of Zululand Lowveld habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.	**MODERATE-LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** **Tower Location and Design Recommendations** • The footprint of the tower must be minimised as far as practically possible • If possible, no lights must be established on the towers. If not possible for legitimate aviation safety or other reasons then mitigations in 7.1.1of Appendix 2 is application. **Tower Access and Service Roads** **Service Road Stormwater Management** **Tower Access and Haulage Roads** **Threatened and Protected Plant Search and Rescue** Prior to construction commencing, the following must be undertaken: • The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads, including Ceropegia crassifolia*. • Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented. **Demarcation of 'No-Go' areas and construction corridors** • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and **demarcated** using brightly coloured shade cloth: o Outer edge of all outcrops within 30m of the tower footprint, construction area and access / service roads. o The outer edges of the entire construction corridor / right-of-way. The outer edges of the entire construction corridor / right-of-way. **Method Statements for working in Zululand Lowveld** **Prohibitions related to animals** **General rehabilitation guidelines** **Construction phase monitoring measures**	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Impacts to local and regional landscape ecological processes through Ecosystem fragmentation to Zululand Lowveld and Fauna displacement and/or fatalities **Nature:** Establishment of Tower establishment, Access road and Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads **Residual Impacts:** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of grassland, wooded grassland and woodland habitat • Flora and fauna stress and/or fatalities as a result of pollution of grassland, wooded grassland and woodland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** **Tower Location and Design Recommendations** • The footprint of the tower must be minimised as far as practically possible • If possible, no lights must be established on the towers. If not possible for legitimate aviation safety or other reasons then mitigations in 7.1.1of Appendix 2 is application. **Tower Access and Service Roads** **Service Road Stormwater Management** **Tower Access and Haulage Roads** **Threatened and Protected Plant Search and Rescue** Prior to construction commencing, the following must be undertaken: • The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads, including Ceropegia crassifolia*. • Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented. **Demarcation of 'No-Go' areas and construction corridors** • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and **demarcated** using brightly coloured shade cloth: o Outer edge of all outcrops within 30m of the tower footprint, construction area and access / service roads. o The outer edges of the entire construction corridor / right-of-way. The outer edges of the entire construction corridor / right-of-way. **Method Statements for working in primary grasslands** **Prohibitions related to animals** **General rehabilitation guidelines** **Construction phase monitoring measures**	**LOW**
OPERATIONAL PHASE IMPACTS			

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 1: Impacts to terrestrial vegetation communities and habitat through the Destruction and modification of the Zululand Lowveld vegetation **Nature:** Accidental direct impacts by heavy machinery during repair and maintenance i.e. poorly planned access roads, vegetation clearing and landcover disturbance during repair and maintenance **Residual Impacts:** Erosion and/or sedimentation of Zululand Lowveld grassland Pollution of Zululand Lowveld grassland	**MODERATE-LOW**	**Refer to section 7of Appendix E2 for general mitigations on** • **Maintenance and management** • **Monitoring**	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Impacts to local and regional landscape ecological processes Fauna displacement and/or fatalities as i.e. poorly planned access roads **Nature:** Accidental direct impacts by heavy machinery during dismantling and rehabilitation soil and vegetation clearing and landcover disturbance during repair and maintenance **Residual Impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Zululand Lowveld • Flora and fauna stress and/or fatalities as a result of pollution of Zululand Lowveld	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** **Tower Location and Design Recommendations** • The footprint of the tower must be minimised as far as practically possible • If possible, no lights must be established on the towers. If not possible for legitimate aviation safety or other reasons then mitigations in 7.1.1of Appendix 2 is application. **Tower Access and Service Roads** **Tower Access and Haulage Roads** **Threatened and Protected Plant Search and Rescue** Prior to construction commencing, the following must be undertaken: • The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads, including Ceropegia crassifolia*. • Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented. **Demarcation of 'No-Go' areas and construction corridors** • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and **demarcated** using brightly coloured shade cloth: o Outer edge of all outcrops within 30m of the tower footprint, construction area and access / service roads. o The outer edges of the entire construction corridor / right-of-way. The outer edges of the entire construction corridor / right-of-way. **Method Statements for working in primary grasslands** **Prohibitions related to animals** **General rehabilitation guidelines** **Construction phase monitoring measures**	**LOW**

7.3.3 Avifauna Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Displacement of SCC and non-SCC priority species as a result of disturbance. Excavation and construction activities are a source of significant disturbance particularly as a result of the machinery and construction personnel that are present on site for the duration of the construction. For most bird species, construction activities are likely to be a cause of temporary disturbance impacting on foraging, and roosting behaviours but in more extreme cases, construction may impact on the breeding success of certain species particularly if the disturbance happens during a critical part of the breeding cycle, resulting in temporary breeding failure or permanent nest abandonment. The development area is already subjected to a degree of disturbance in the form of settlement, and pastoral activities, the existing power line network, in addition to vehicle and pedestrian traffic. Construction activities within the study are likely to result in the temporary displacement as opposed to permanent displacement of species from the area.	**MEDIUM**	• Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise should be applied according to current best practice in the industry.	**LOW**
OPERATIONAL PHASE IMPACTS			

NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 1: Potential collisions with proposed Duma RS tower Potential collision hazard posed to large flying birds, especially threatened species including vultures in an area characterized by a high diversity and large numbers of such species, by the construction of 60-85 m tall telecommunication tower at Duma RS, southeast of Ulundi, KZN at a site in a 'vulture movement corridor' and close to Hluhluwe-Imfolozi Park, southeast of Ulundi, KZN.	**HIGH**	• The key mitigation measure would be to ensure the tower does not have lateral support cables.	**LOW**

7.3.4 Heritage & Palaeontological Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Direct or physical impacts, implying alteration or destruction of heritage features **Nature**: As no sites, features or objects of cultural heritage significance were identified on the project area, there would be no impact as a result of the proposed development	**LOW**	• Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation	**LOW**

NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
		and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).	
Impact 2: Destruction, Damage & Loss of fossil material The sources of these impacts include the, the removal of vegetation, sealing-in or destruction of fossils, and digging of foundations. This activity is particularly significant where tower is constructed.	**LOW**	• Footprint of tower foundation should be as small as possible • The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures. • Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.	**LOW**
OPERATIONAL PHASE IMPACTS			
Impact 1: Loss or damage to sites, features or objects of cultural heritage significance **Nature:** A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years	Negligible	None required.	Negligible

7.3.5 Visual Impacts Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Severity of impacts on observers (OB) i.e. Residents inside Zone of Maximum Visual Exposure (ZMVE) **Nature of impact**: The Duma tower will be located inside the footprint of the future Duma Substation and construction activities are expected to occur within the substation area. However, a construction camp and laydown yard are expected to be located outside the Duma Substation. The construction phase will introduce new elements to the visual environment (i.e. construction camp and workforce) that are otherwise uncharacteristic within the context of the study area. Limited visual intrusion is expected as a result of the containment of construction activities inside the substation footprint. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers that are in a very close proximity to the tower site. As the tower construction extend its height, the ZVI will increase and affect observers in a larger zone. **Residual Risks:** Residual risks will occur and remain as impacts as the visual intrusion and impact on the landscape character cannot be effectively mitigated, unless major layout or design changes are made.	**MEDIUM**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Severity of impacts on observers (OB) (i.e. Residents outside ZMVE & Motorist) and Landscape character (LC) **Nature of impact**: The Duma tower will be located inside the footprint of the future Duma Substation and construction activities are expected to occur within the substation area. However, a construction camp and laydown yard are expected to be located outside the Duma Substation. The construction phase will introduce new elements to the visual environment (i.e. construction camp and workforce) that are otherwise uncharacteristic within the context of the study area. Limited visual intrusion is expected as a result of the containment of construction activities inside the substation footprint. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers that are in a very close proximity to the tower site. As the tower construction extend its height, the ZVI will increase and affect observers in a larger zone. **Residual Risks:** Residual risks will occur and remain as impacts as the visual intrusion and impact on the landscape character cannot be effectively mitigated, unless major layout or design changes are made.	**LOW**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.	**VERY LOW**
OPERATIONAL PHASE IMPACTS			
Impact 1: Severity of impacts on observers (OB) i.e. Residents inside Zone of Maximum Visual Exposure (ZMVE) **Nature of impact**: The Duma tower will be located inside the footprint of the future Duma Substation and construction activities are expected to occur within the	**MEDIUM**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
substation area. However, a construction camp and laydown yard are expected to be located outside the Duma Substation. The construction phase will introduce new elements to the visual environment (i.e. construction camp and workforce) that are otherwise uncharacteristic within the context of the study area. Limited visual intrusion is expected as a result of the containment of construction activities inside the substation footprint. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers that are in a very close proximity to the tower site. As the tower construction extend its height, the ZVI will increase and affect observers in a larger zone. **Residual Risks:** Residual risks will occur and remain as impacts as the visual intrusion and impact on the landscape character cannot be effectively mitigated, unless major layout or design changes are made.		the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals. •	
Impact 2: Severity of impacts on observers (OB) (i.e. Residents outside ZMVE & Motorist) and Landscape character (LC) **Nature of impact**: The Duma tower will be located inside the footprint of the future Duma Substation and construction activities are expected to occur within the substation area. However, a construction camp and laydown yard are expected to be located outside the Duma Substation. The construction phase will introduce new elements to the visual environment (i.e. construction camp and workforce) that are otherwise uncharacteristic within the context of the study area. Limited visual intrusion is expected as a result of the containment of construction activities inside the substation footprint. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers that	**MEDIUM**	• Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the boundaries of the Duma Substation. • Construct the substation and tower at the same time to avoid extended construction phases. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals. •	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
are in a very close proximity to the tower site. As the tower construction extend its height, the ZVI will increase and affect observers in a larger zone. **Residual Risks:** Residual risks will occur and remain as impacts as the visual intrusion and impact on the landscape character cannot be effectively mitigated, unless major layout or design changes are made.			

7.3.6 Agriculture Potential Impact Assessment

Activity	Nature of potential impact/risk	Significance (without mitigation)	Proposed Mitigation	Significance (with mitigation)
CONSTRUCTION PHASE IMPACTS				
Construction activities, Vehicle operation on site, Dust generation and the creation of access roads.	**Direct Impacts:** Loss of agricultural land (land that is no longer able to be utilized due to construction) **Indirect Impacts:** Overall loss of farmland, income and change in livelihood **Cumulative Impacts:** Tower footprints are limited in spatial extent and once in place do not lead to additional spatial or land use impacts.	**MEDIUM**	The site areas are not of commercial agriculture value. The project requires about 900 m2 footprint per project site which will not have any major significant impact on land availability for agricultural production in the future.	**LOW**
OPERATIONAL PHASE IMPACTS				
Operation of the Tower Loss of agricultural production		**LOW**	• Tower footprints and infrastructure are permanent and cannot be mitigated	**LOW**

7.3.7 Social Impacts Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Construction and operation activities of the Tower	**Direct Impacts:** Inflow of Workers **Indirect Impacts:** The influx of outsiders to an area is also almost always perceived to increase the crime levels in such an area. One could therefore assume that security concerns would be prevalent among the local residents. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	• Local labourers should be employed where possible. • Labourers should remain at their existing residences. No workers should thus be accommodated on site at night. The erection of a construction camp where workers would be housed would not be recommended. • Before construction commences, representatives from the municipality, other community leaders (e.g. councillors) and as well as management structures of the security villages and complexes, as well as residential areas should be informed of the details of the contractors, size of the workforce and construction schedules. • The contractor should make certain that the "outside" workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the local communities do not create conflict in the surrounding communities. • Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant).	**LOW**
Construction and operation activities of the Tower	**Direct Impacts:** Employment Opportunities (positive) **Indirect Impacts:** Construction workers remaining in the larger area once this development has been completed. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	Enhancements: • The use of local labour should be maximised where possible. • Local people could be employed during the construction phase as Community Liaison officers. • Eskom and the appointed contractors should promote capacity building through skills development. • Eskom and the appointed contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses and SMME's during the construction and operational process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME's from the local sector.	**MEDIUM**
Construction and operation activities of the Tower	**Direct Impacts:** Impact on Sense of Place **Indirect Impacts:** Possible negative visual change in the landscape character **Cumulative Impacts:** Possible impact on overall visual environment due to various the presence of the Tower	**LOW**	• Construction sites should be screened from the property owners and mtorists where possible. • Stockpiling of soil should be as short as possible and construction debris should be removed as soon as construction activities allow. • Construction sites should be rehabilitated as soon as planning allows • Tower placements should preferably be as far from dwellings as possible	**LOW**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
infrastructure within the study area				

7.4 Do Nothing Alternative Assessment

No go Alternative (compulsory). This is the alternative of not developing the Duma Telecommunication Tower. This alternative will result in limited construction impacts already occurring in the study area. The proposed telecommunication mast would serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors for the Duma Substation However, should the infrastructure not be developed as proposed, Eskom cannot provide this service to Transnet., in order for Eskom to provide the necessary services to the network, it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation. Services like tele-protection, tele-control, switched voice, direct voice and hot lines as well as data services like Ethernet connectivity. This is an undesirable alternative for the project as it will pose negative impacts from the social and economic perspective and is not considered desirable. The negative impacts of the no go alternative are considered to outweigh the positive impacts of this alternative. The no go alternative is therefore not preferred.

Table 8: Do Nothing Alternative Assessment

Potential impacts:	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact and mitigation not being implemented**
Impact to possible wetland – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – Low	Low risk
Impacts to terrestrial vegetation communities and habitat: Destruction and modification of the Zululand Lowveld habitat – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – Medium	Low risk
Impacts to terrestrial biota / species (flora and fauna): Fauna displacement and/or flora and fauna fatalities – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Potential increase in alien and invasive vegetation – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Impacts to local and regional landscape ecological processes through Ecosystem fragmentation to Zululand Lowveld and Fauna displacement and/or fatalities – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Contamination of fauna environment through use and storage of hazardous substances,	P – Low	There are no mitigation measures	P – Low	Low risk

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

		upliftment in these areas will occur as a basic need is being met.		

7.5 Cumulative Impacts Assessment

The natural vegetation cover in the study area consists mostly of the Zululand Lowveld vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2018)) which is a combination of homogenous savannah vegetation patterns, known for its tall grasslands, interspersed with groupings of thorn trees or dense woodlands along drainage lines. The study area is considered natural/rural with a sparse network of roads leading to widely distributed settlements and villages. The rural settlements consist of simple structures, often rondavel type buildings or small square houses, loosely grouped together and sparsely distributed. Informal subsistence farming occurs in the open spaces between the houses and are mostly recognised by free roaming livestock and small cultivated fields. The less accessible areas along rivers and on the steeper slopes portray a natural character and consist of the denser vegetation type as described previously. The only major road in the study area is the P700 which connects to Ulundi in the north and meanders through the rural areas to Ntambana in the south. A sparse gravel road network taps off from the P700 to connect to the widely distributed villages. The Hluhluwe-iMfolozi Park's (HiP) southern boundary is located approximately 5km to the northeast of the project site.

Generally, the cumulative impact is rated as Low fort the larger part of the project as it falls within developed areas. Potential cumulative impacts that could translate into population level impacts on affected populations of large birds, especially threatened species including vultures, are indeed of great relevance and concern here due to the widespread and accelerating proliferation of communication towers across the South African landscape. This renders the mitigation measure even more imperative. In terms of the visual Assessment, a risk of cumulative impacts is likely as the tower site will comprise of a future substation and existing transmission lines already pass the site. The dominance of the industrial character will be compounded.

8 CONCLUSIONS AND RECOMMENDATIONS

The previous chapters of this report together with the specialist studies contained within **Appendix E** provide a detailed assessment of the potential impacts that may result from the proposed project. This chapter concludes the Basic Assessment Report for the proposed Tower by providing a summary of the conclusions of the assessment of the proposed Telecommunication Radio Tower. In so doing, it draws on the information gathered as part of the BA process and the knowledge gained by the environmental specialist consultants and presents an informed opinion of the environmental impacts associated with the proposed project. Potential impacts which could occur as a result of the proposed project are summarised in the sections which follows.

8.1. Summary of Specialists findings

The specialist findings are summarised as follows:

Aquatic and Wetland Impact Assessment

The results of the risk assessment for GF1A tower impacts to freshwater ecosystems are shown in Table 18 below. All the impacts will be of low risk under a good mitigation scenario. The results of the risk assessment for GF3A impacts to freshwater ecosystems. All the impacts will be of low risk under a good mitigation scenario.

Terrestrial Biodiversity (vegetation and Fauna)

The proposed tower will likely result in small, localised direct and indirect impacts to disturbed Zululand Lowveld and possibly several protected plant species. In addition, the tower poses a small bird collision risk.

Under both poor and good mitigation scenarios, the significance of Impact O1-1 was assessed as moderate. All the remaining potential impacts to the Zululand Lowveld and the other threatened fauna were assessed as being of moderately-low significance under a poor mitigation scenario. With the effective implementation of the mitigation measures recommended in the Terrestrial Biodiversity Impact Assessment report, under a good mitigation scenario, the significance of all the remaining impacts to the degraded Zululand Lowveld threatened biota (excluding avifauna) can be reduced to low.

Although the absence of guy wires will reduce the collision risks, such risks will always be a possibility and the location of towers close to such an important area for bird diversity conservation is not best practice. The objective of maintaining of the moderate significance rating is twofold: (1) to acknowledge the uncertainty of predicting this impact considering the lack of data; and (2) to flag the impact as potentially significant in line with the precautionary principle but not a fatal flaw. It will be important to improve the certainty of this impact assessment by incorporating Ezemvelo KZN Wildlife's knowledge of the site and species behaviour and flight patterns in the local air space, as well as negotiate and achieve consensus with them on the acceptability of this impact and whether they are willing to accept the risks in light of the socio-economic need for the tower.

Avifauna Impact Assessment

The proposed Duma RS tower is of avifaunal concern relevant to collisions. This area supports threatened bird species including vultures vulnerable to collisions with such elevated structures and their associated infrastructure. The proposed tower is located particularly close (4.3 km) to the Hluhulwe-Imfolozi Park, a major stronghold of many of the threatened bird species of concern here, especially White-backed Vulture. EKZNW have raised significant concerns relevant to tower construction in this area, especially as relates to the tower

being located in a 'vulture movement corridor'. They have specifically recommended that such towers be re-located outside this corridor, a suggestion which has not been taken up by Eskom. The proposed Duma RS tower is situated at a locality without any existing towers. It is situated in a low-elevation area unlikely to be subject to poor visibility due to low cloud and mist. The proposed tower height is 60 m, which is not particularly tall, if the proposed Greenfields paired tower options NGF2 and VGF1 are chosen, and 85 m if the proposed GF1A and GF3A paired tower options are chosen (a choice which is not supported). The proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. The Duma RS tower option should only be pursued if it is considered mandatory that any tower constructed at this locality not have lateral support cables as these present the greatest collision hazard to flying birds. Marking such cables with bird diverters should not be considered as comprising an adequate mitigation measure in these circumstances.

Heritage & Palaeontological Assessment:

During the survey no sites, features or objects of cultural heritage significance were identified in the project area. Impact assessment and proposed mitigation measures Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development: For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed. From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below. Conditions for inclusion in the environmental authorisation. The Palaeontological Sensitivity Map (SAHRIS) indicates that the project area falls in a region where the palaeontological sensitivity is unknown and therefore it will require a minimum of a desktop assessment.

There is no objection to the development, it was necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study to determine whether the development will affect fossiliferous outcrops as the palaeontological sensitivity of the area is Very High and Moderate. This project may benefit the rail users, will create short- and long-term employment, the life expectancy of the community, the growth of the community and social development in general. All the land involved in the development was assessed and none of the property is unsuitable for development. Areas that would involve mitigation and may need a permit from the South African Heritage Resources Agency are discussed. The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures. Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.

Visual Assessment

The significance of the visual impact is determined through separate assessments of impacts on the landscape character and impacts on observers in the study area. This has been done for the construction and operational phases as each phase presents different impacts. The landscape character and the observers are receptors in the study area and have different sensitivities. It is expected that each receptor will respond differently to the anticipated visual impacts.

The sources of visual impacts will originate from the construction activity and the presence of a workforce and machinery operating during the construction process. When this is complete, the newly constructed tower will also be a source of visual impact as its presence will result in a visual change to the existing baseline environment.

During both phases, inherent mitigating factors for example screening by the topography or vegetation and distance from the source of impact, increases the VAC and limits the ZVI. The inherent mitigation factors are not enough to completely eliminate the potential impacts, and additional mitigation measures should be considered.
Observers in the study area will be affected differently by the potential impacts, due to their distance away from the source of impact and their sensitivity towards their visual environment. Residents are considered the most sensitive observers if they are located within 2km from the source of impact, i.e., the Zone of Maximum Visual Exposure (ZMVE). The highest concentration residents are located west and south of the proposed tower site and forms part of the Debe rural settlement. These residents will be within the ZMVE and will experience full views of the proposed tower. They are expected to experience a moderate significant visual impact.

The rural settlement of Emkhandlwini is located 6km south of the tower site and is outside the ZMVE. Their exposure to the potential visual impacts will be much reduced due to their distance from the source of impact and their sensitivity is expected to be low. Residents outside the ZMVE are expected to experience a moderate/minor impact significance, mainly due to the distance factor considerably reducing the level of visual intrusion.
The landscape character will experience a transformation as a result of a new tower in the study area and the compounded industrial character created by the Duma Substation and existing transmission lines. This will contrast with the natural-rural landscape character found in the general area. An inherent mitigating factor is the tower's slender, lattice structure that has a relatively small "visual footprint". The impact significance is expected to be moderate/minor. Impacts can be marginally mitigated during the construction phase, but little can be done to mitigate impacts during the operational phase unless major design changes are considered.

Recommended Alternative: the viewshed comparison (**Figure 23**) shows marginal changes between the 85m and 65m tower heights. This confirms the low to moderate topographic variation in the study area and the limited effect of the topography on the visibility of the proposed tower, irrespective of its height. *No fatally flawed issues are identified, and as far as visual and landscape impacts are concerned, the projects do not cause excessive negative impacts. However, the recommended mitigation measures should be considered and implemented as far as possible.*

Agricultural Potential Assessment

Results of the study shows that the proposed construction of the Tower will not have a negative impact especially in terms of loss of land for agriculture. There is no commercial agricultural activity identified as indicated in the report. The current agricultural production is on subsistence level (natural grazing).

There are no major fatal flaws regarding the study areas. The sites are vacant lands where there is no major agricultural production except for pockets of grazing land and scattered forests. The recommendation is for the project to continue as planned by making use of the land portion for a positive economic activity that will support job creation for the growing population of the region.

Social-Economic Impact Assessment

The majority of the negative social impacts anticipated are of a low significance and are anticipated to respond to mitigation. Even though the impacts are thus of importance, mitigation could reduce the negative impacts to acceptable levels.

Although negative social impacts would be experienced, the necessary electrical input into the Transnet railway system is vital. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the

Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported

Cumulative Impact Assessment:

Negligible degradation of Zululand Lowveld grassland if the recommended mitigation measures are effectively implemented. Very small reductions in threatened bird populations due to possible local tower collisions. In terms of the visual impact of the area, cumulative impacts are generally probable and the visual dominance of a Tower infrastructure will be increased and aggravates visual intrusion levels.

No-go alternative

The No-Go alternative in the context of this project implies that the telecommunication mast would not be constructed and the current land use would persist. If the project does not proceed the negative impacts such as risk of collisions of birds would be avoided. However, it would also mean that the project would not provide the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards.

Based on above points, the 'No-go' alternative is therefore not considered to be a feasible alternative and will not be considered further within the EIA process.

8.2. Summary of Impacts

A summary of the impact assessments is presented in **Table 9**; the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

< 30	**Low significance**
30 to 60	**Moderate significance**
>60	**High significance**

It must be noted that the impact scores in **Table 9** below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

Table 9: Impact Summary table

CONSTRUCTION PHASE		
Environmental Aspect	**Without Mitigation**	**With Mitigation**
Aquatic and Wetland Impact Assessment		

Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat: Destruction and modification of the Zululand Lowveld habitat	Medium-Low	Low
Impacts to terrestrial biota / species (flora and fauna): Fauna displacement and/or flora and fauna fatalities	Medium	Low
Impacts to local and regional landscape ecological processes: Ecosystem fragmentation & Fauna displacement and/or fatalities	Low	Low
Paleo Impact		
Destruction, Damage & Loss of fossil material	Low	Low
Visual Impacts		
Severity of impacts on observers (OB) i.e. Residents inside Zone of Maximum Visual Exposure (ZMVE)	Low	Low
Severity of impacts on observers (OB) (i.e. Residents outside ZMVE & Motorist) and Landscape character (LC)	Low	Low
Agriculture Potential Impact		
Loss of agricultural land	Low	Low
Social Impacts		
Inflow of Workers	Low	Low
Employment Opportunities (positive)	Medium	Low
Impact on Sense of Place	Low	Low
OPERATIONAL PHASE		
Environmental Aspect	**Without Mitigation**	**With Mitigation**
Aquatic and Wetland Impact Assessment		
Physical Disturbance, Erosive water and/ or eroded sediment and Pollutants	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat: Destruction and modification to Zululand Lowveld habitat	Moderate-Low	Low
Impacts to local and regional landscape ecological processes: Fauna displacement and/or fatalities	Low	Low
Paleo Impact		
Destruction, Damage & Loss of fossil material	Negligible	Negligible
Visual Impacts		
• Severity of impacts on observers (OB) i.e. Residents inside Zone of Maximum Visual Exposure (ZMVE)	Medium	Medium
• Severity of impacts on observers (OB) (i.e. Residents outside ZMVE & Motorist) and Landscape character (LC)	Medium	Medium
Agriculture Potential Impact		
Loss of agricultural production	Low	Low
Social Impacts		
Impact on Land Use and Future Developments	Low	Low
Impact on Property Values	Low	Low
Impact on Sense of Place	Low	Low

8.3. Environmental Sensitivities

From the conclusions of the detailed studies undertaken, sensitive areas within the development 500m corridor were identified and flagged for consideration and avoidance (where possible) by the final alignment position of the tower. The following highly sensitive areas/environmental features as shown in **Figure 27** have been identified on the site:

- Protected plants within 100m of the tower site: A number of species at the sites is protected by provincial conservation legislation. These all require a permit from Ezemvelo KZN Wildlife before they can be disturbed, or relocated
- The most significant impact flagged is the tower collision mortality risk posed to threatened bird species, particularly vultures and eagles that occur in higher-than-normal densities in the area due to the proximity of the site to important conservation areas and ecological corridors.
- Visual Receptors of High Sensitivity:
    - Residents in the study area are generally classified as **visual receptors of high sensitivity** owing to their sustained visual exposure and attentive interest towards their living environment. The highest concentration residents are located west and south of the proposed tower site and forms part of the Debe rural settlement. These residents will be within the ZMVE and will experience full views of the proposed tower.
    - Tourists are considered to travel periodically through the area but at **a very low frequency** as the site is not near any major tourist attractions. The Opathe Game Reserve and HiP are west and north of the tower site respectively, but main entrances and overnight accommodation are located outside of the study area. The only exception is the mFulaWozi Wilderness Private Game Reserve featuring the Mthembu & Biyela lodges approximately 9 km north of the tower site. The exclusive reserve is located next to the White Mofolozi River, and its low laying location will be screened from the tower. In addition, the reserve is on the outer edge of the visual detection range and visual exposure is considered negligible;
    - The **landscape character sensitivity is considered medium** and is attributed to the generally undeveloped nature of the majority of the study area and the natural vegetation cover that is largely intact, although partially transformed in and around the settlements. The tower site i.e., within the future Duma Substation next to the existing transmission lines, is transformed thereby influencing the sensitivity of the landscape character at that location.

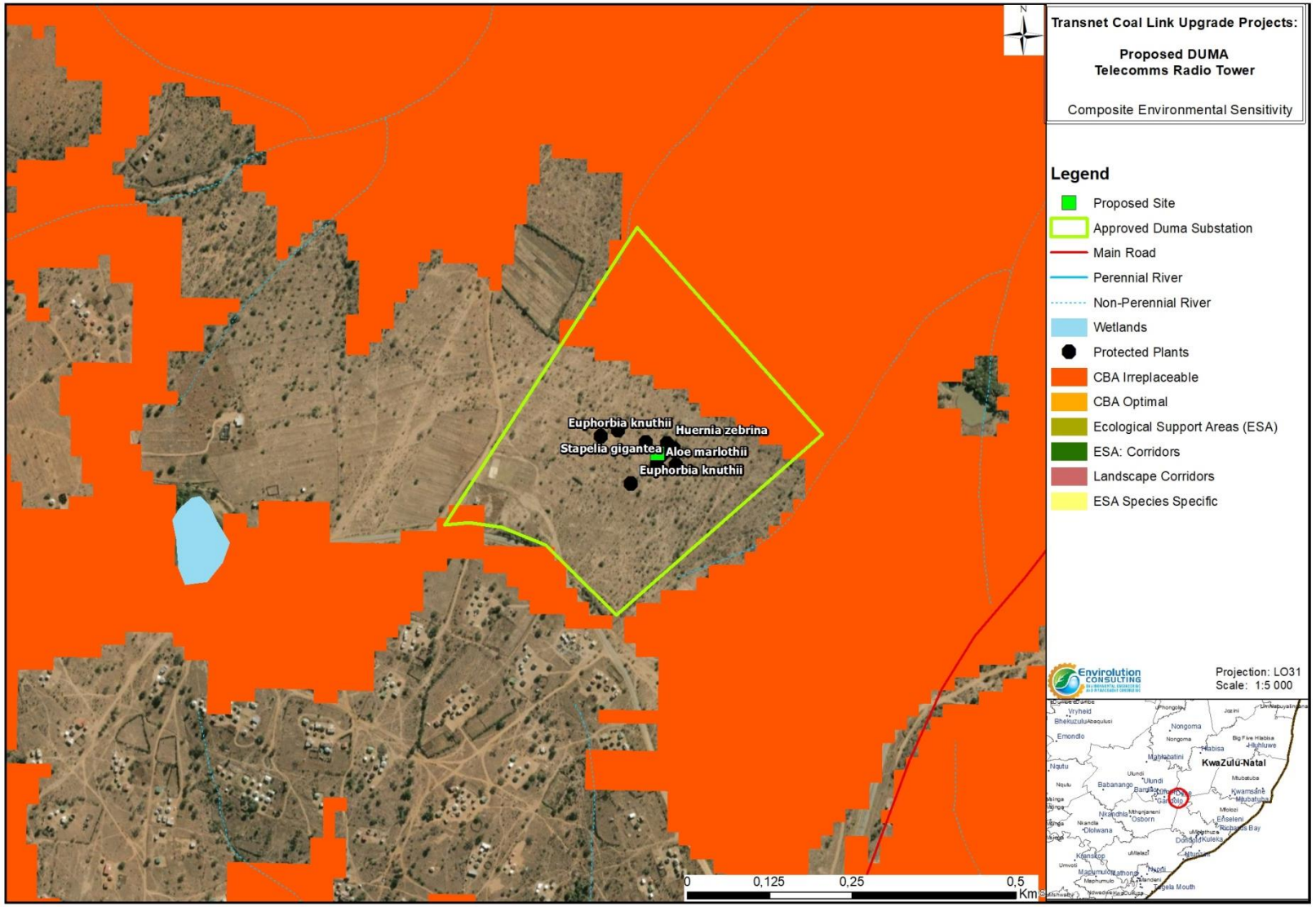

Figure 27: Composite Environmental Sensitivity Map for the proposed Duma Telecommunication Radio Tower site showing areas of sensitivity

8.4. Conclusion (Impact Statement)

As summarised in Table 9, it's been noted that the majority of the negative impacts associated with the construction of the proposed Duma Telecommunication Radio Tower are short-term (i.e. during the construction phase), **majority of the negative impacts identified can be mitigated to low significance** if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix F. **The most significant impact flagged is the tower collision mortality risk posed to threatened bird species, that occur in higher-than-normal densities in the area due to the proximity of the site to important conservation areas and ecological corridors.** The following mitigations are proposed in order to reduce the risk i) utilising the proposed Greenfields paired tower options NGF2 and VGF1 where the proposed tower height is 60 m and 70m, which is not particularly tall, and ii) the proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. *However according to Eskom, they have moved away from this type as it is very difficult to maintain during its lifetime. According to the Eskom technical team, they currently don't have access to well proven technology in SA to ascertain the technical properties of the structure over its lifespan due to degradation that may occur due to any external factors. We have also found that Lattice structures are more robust and durable for our network needs*

Environmental constraints as listed on section 8.3 and shown in the environmental sensitivity map (**Figure 27**) includes are features that could be avoided during the detail design phase of the project, by careful placing of tower footprint. Owing to the fact that the project is for the provision of the requirement to serve as voice, data as well as other telecommunications and ancillary services for Eskom staff and contractors which are meant to improve service levels and efficiencies to ensure volume growth, to meet core telecommunication specifications in support of maintenance standards, most of the impacts resulting from the project aspects are anticipated to be positive more so in the long-term of the implementation of the project, these benefits of the project are expected to occur beyond the local area therefore the benefits partially offset the localised environmental costs of the project.

The findings this report indicate that there are **no significant environmental fatal flaws** associated with the proposed development, the majority of the negative impacts associated with the project are minor, the positive impacts outweigh the negatives considerably and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable. Responsible environmental management will be required on site, during the planning and construction phases of the project. It is therefore the **opinion of the EAP that the proposed development could proceed** as all impacts identified are localised and manageable provided that the mitigation measures set out in this report (refer to section 8.5) and in the EMPr (Appendix F) are diligently implemented to limit the potential impacts on sensitive ecological and visual aspects of the project during construction and operation of the development.

8.5. Recommendations

The EAP **recommends** that the **construction of the proposed Duma Telecommunication Radio Tower be authorised**. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation, specialist report recommendations and all other relevant environmental legislation. The following relevant **conditions would be required** to be included within an authorisation issued for the project.

- An independent Environmental Control Officer (ECO) should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- The following mitigation measures to reduce the occurrence of bird collisions with towers must be adhered to:
  - Utilising the proposed Greenfields paired tower options NGF2 and VGF1 where the proposed tower height is 60m and 70m respectively,
  - the proposed structure should ideally be a tubular monopole rather than the planned lattice structure but this is not an issue of over-riding concern. Threatened and Protected Plant Search and Rescue: Prior to construction commencing, the following must be undertaken:
  - The protected plants within and in the vicinity of the development footprint must be relocated to suitable areas by a person with suitable horticultural experience, and in particular experience in relocating indigenous plants within natural habitats. The translocation should occur in mid-summer to ensure that all individuals are picked up during the relocation. In this regard, a careful search must be made in order to relocate any *stapeliads*, including *Ceropegia crassifolia*.
  - Permits to translocate such species must be acquired and a search and rescue plan must be compiled and implemented.
- Stormwater Management Plan is established for the Service Road. All erosion protection measures must be established to reflect the natural slope of the surface and located at the natural ground-level.
- Demarcation of 'No-Go' areas and construction corridors
- Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- The developer should obtain all necessary permits prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species.

9 APPENDICES

Appendix A: Maps

- Appendix A1: Locality Maps
- Appendix A2: Sensitivity Maps
- Appendix A3: Composite Environmental Sensitivity Map

Appendix B: Facility illustration(s)

Appendix C: **DFFE Correspondence**

Appendix D: Public Participation Process

- Appendix D1: Proof of Site Notice
- Appendix D2: Proof of newspaper advertisements
- Appendix D3: Written Notifications
- Appendix D4: Previous Correspondences with I&APs
- Appendix D5: Comments from I&APs on Draft Report
- Appendix D6: Minutes of meetings
- Appendix D7: Comments and Responses Report
- Appendix D8: List of registered I&APs

Appendix E: Specialist reports

- Appendix E1: Aquatic and Wetland Impact Assessment
- Appendix E2: Terrestrial Ecological Impact Assessment
- Appendix E3: Avifauna Impact Assessment
- Appendix E4: Heritage Impact Assessment
- Appendix E5: Palaeontological (Desk-Top) Impact Assessment:
- Appendix E6: Visual Impact Assessment
- Appendix E7: Agriculture Potential Assessment

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Additional Information

- Appendix G1: Details of EAP (and expertise) and affirmation
- Appendix G2: Specialist's declaration of interest
- Appendix G3: Screening Report