BASIC ASSESSMENT PROCESS

for

THE PROPOSED CONSTRUCTION OF THE 2X GREENFIELD SITES TELECOMMUNICATION RADIO TOWER WITHIN ULUNDI & MTHONJANENI LOCAL MUNICIPALITY, KWAZULU-NATAL

DRAFT BASIC ASSESSMENT REPORT

23 June 2023 to 24 July 2023

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PROJECT DETAILS

DFFE Reference No.	**:**	Not assigned as yet
Title	**:**	Basic Assessment Process for the Proposed Construction of the **2x Greenfield Sites Telecommunication Radio Tower** within Ulundi & 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: 087 898 5000 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

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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. Duma Substation (SS) which is positioned 28 27 19.92 S and 31 42 20.83 E, new substation to be built by Transmission in order to strengthen the TX grid so that Eskom can provide services to Transnet. Various sites were investigated surrounding Duma SS, upon further investigations and analysis and using a process of elimination four (4) greenfield sites were identified and two sites are required for the Duma Substation.. The name of the Greenfield sites is yet to be decided upon and therefore for the purposes of this document and to make reference to these sites will be referred to as VGF1 & NGF2 and Greenfield 1A & Greenfield 3A. Therefore the Duma Substation will connect to either VGF1 & NGF2 or to the Greenfield 1A & Greenfield 3A.

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 communication services for its infrastructures 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. Therefore the Construction of the 2X Greenfield Sites Telecommunication Radio Tower is proposed in the Ulundi & Mthonjaneni Local Municipality in Kwazulu-Natal as shown in Figure 2. The Masts will be approximately 65m (NGF2 and VGF1); and 80m (Greenfield 1A and Greenfield 3A) in height requiring a foot print of 30m X 30m.

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 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.

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 provide the necessary services it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

In addition, these 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 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.

CONCLUSION (IMPACT STATEMENT)

The proposed Construction of the 2x Greenfield Sites Telecommunication Radio Tower as part of a suite of projects collectively known as the Transnet Coal Link Upgrade Projects. The proposed telecommunication mast would serve as voice and date telecommunication mechanisms for Eskom staff and contractors. The proposed Tower will be located approx. 20km south east of Ulundi within the Ulundi and Mthonjaneni Local Municipality in KwaZulu-Natal. Figure 3 illustrates the project location.

The assessment notes that the majority of the negative impacts associated with the construction of the proposed Greenfield Telecommunication Radio Tower as summarised in Table 15 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 65 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.

Environmental constraints as shown in the environmental sensitivity map (Figure 58) 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 in 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 7.3) 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 2x Greenfield Telecommunication Radio Tower (NGF2 & VGF1 sites) 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 65m and 70m respectively, which is not particularly tall,
    - 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 protected species or plant of conservation concern.
- 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.

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 **2x Greenfield 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,
3830

Ulundi Library
cnr of Princess Magogo & King Zwelithini
Ulundi

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

Environmental Assessment Practitioner

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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 the 2x Greenfield Sites Telecommunication Radio Tower within Mthonjaneni Local Municipality is part of a suite of projects collectively known as the Transnet Coal Link Upgrade Projects.

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.

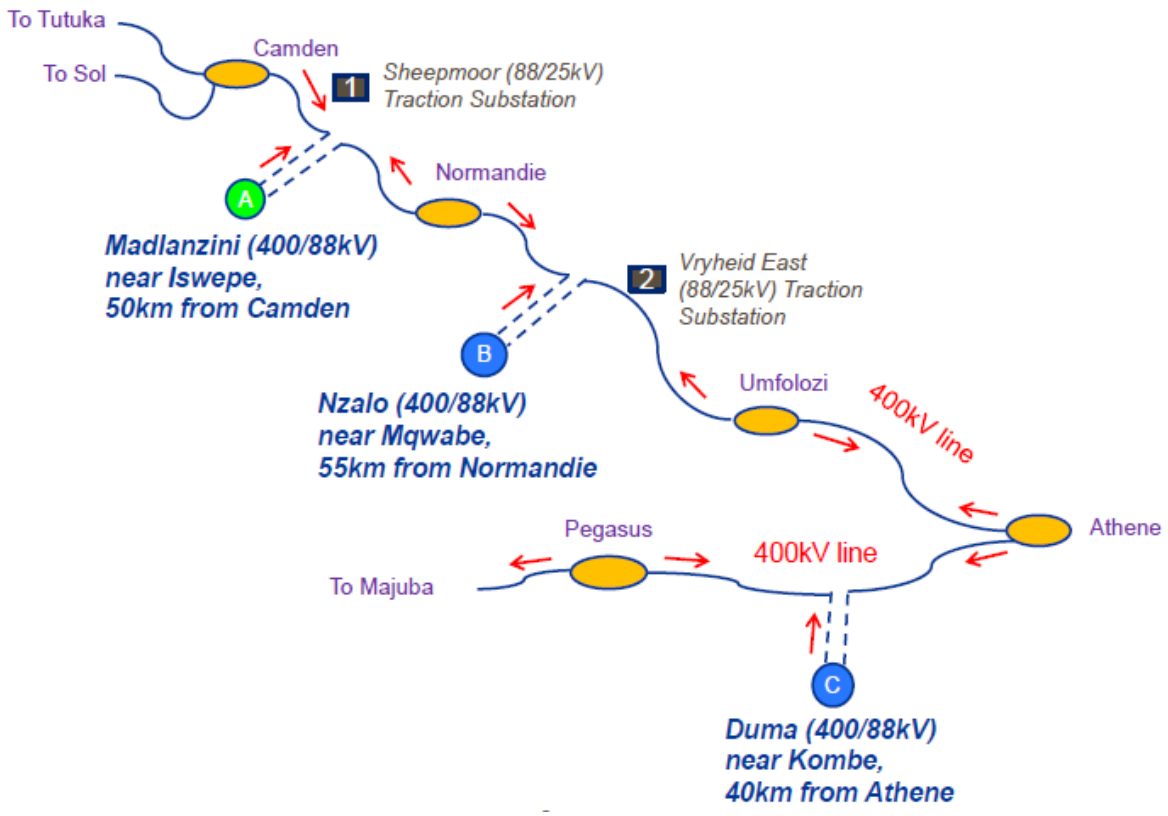

Figure 1: Transnet Project Overview

Transnet Freight Rail Coal Line Upgrade Project Overview as shown in **Figure 1** can be summarised as follows:

- 3 x New Transmission Main Transmission Substations (MTSs) (Madlanziniin Mpumalanga, Nzalo and 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

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. Duma Substation (SS) which is positioned 28 27 19.92 S and 31 42 20.83 E, new substation to be built by Transmission in order to strengthen the TX grid so that Eskom can provide services to Transnet. Various sites were investigated surrounding Duma SS, upon further investigations and analysis and using a process of elimination four (4) greenfield sites were identified and two sites are required for the Duma Substation.. The name of the Greenfield sites is yet to be decided upon and therefore for the purposes of this document and to make reference to these sites will be referred to as VGF1 & NGF2 and Greenfield 1A & Greenfield 3A. Therefore the Duma Substation will connect to either VGF1 & NGF2 or to the Greenfield 1A & Greenfield 3A.

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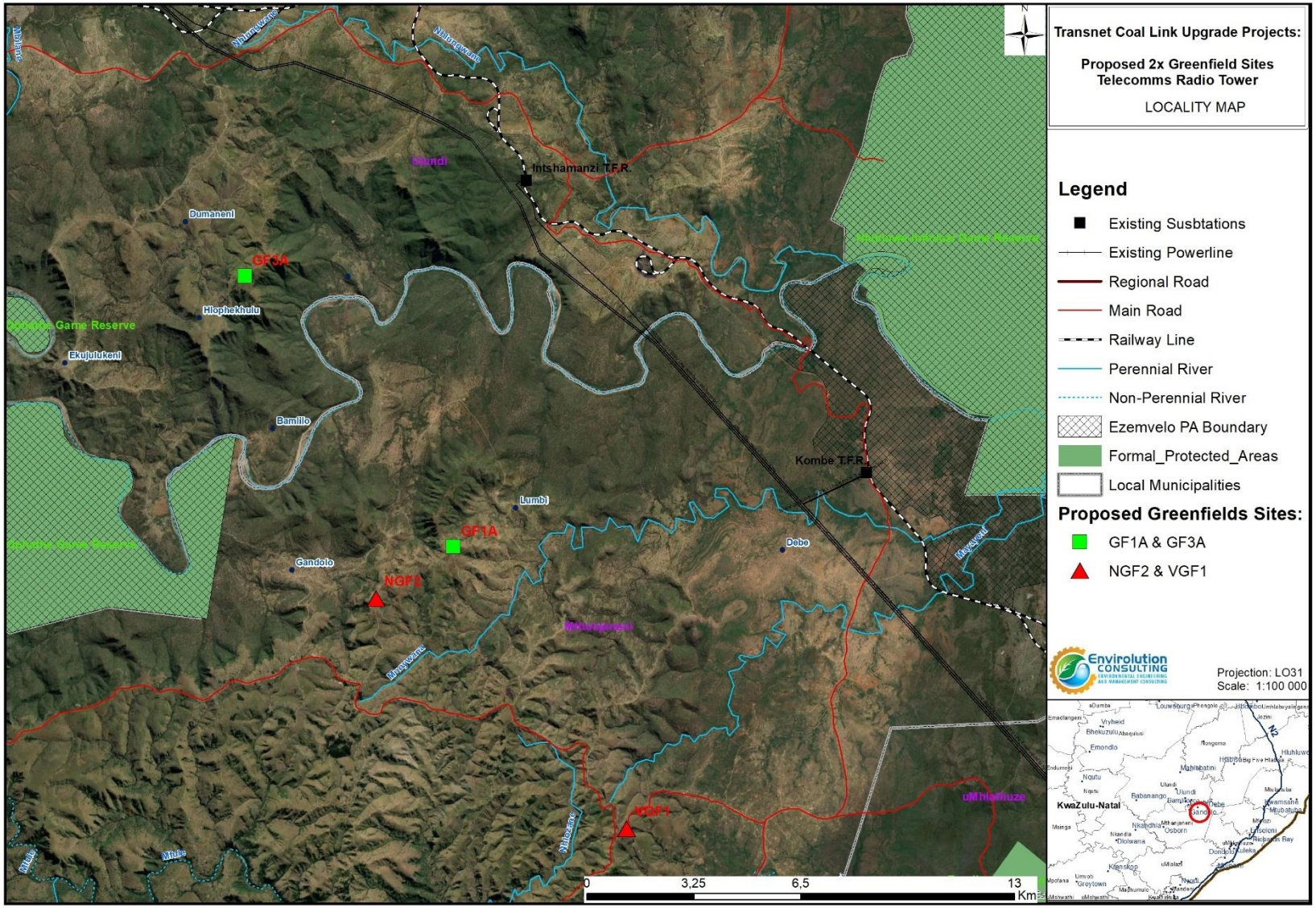

Figure 2: Locality map showing the proposed 2x Greenfield Site Telecommunication Radio Tower options

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.

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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
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E-mail:	bokwett@eskom.co.za

II. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)'s DETAILS

Environmental Assessment Practitioner (EAP):	Karthigesan Govender		
Contact person:	Sheila Bolingo		
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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 principle author of this Report holds an Msc degree in Environmental Management with 12 years of experience in the consulting field. 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 Environmental Assessment Practitioner (EAP) 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 EIA's 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 and date telecommunication mechanisms for Eskom staff and contractors. The proposed Tower will be located between Ulundi & Melmoth within the Ulundi and Mthonjaneni Local Municipality in KwaZulu-Natal Province as described in the table below. **Figure 3** illustrates the project location. Access to the site is to comprise a single-lane gravel access road; this will be approximately 200m long. The exact position and type of road will be determined once the tower position has been confirmed through the negotiation process.

SITES	Co-ordinates	Local Municipality (LM) & District	Farm & Portion, SG code	Ward	Height
Greenfield 3A	28°22'40.34"S 31°30'58.22"E	Ulundi LM Zululand District Municipality	RE/ XIMBA 16506 GU N0GU00000001650600000.	24	80
Greenfield 1A	28°27'3.24"S 31°34'57.55"E	Mthonjaneni LM King Cetshwayo District	Portion 4 Reserve No 11 15831GU N0GU00000001583100004	12	80
NGF2	28°27'56.43"S 31°33'32.24"E	Mthonjaneni LM King Cetshwayo District	Portion 3 Reserve No 11 15831GU N0GU00000001583100003	1	65
VGF1	28°31'38.15"S 31°38'17.87"E	Mthonjaneni LM King Cetshwayo District	Portion 4 Reserve No 11 15831GU N0GU00000001583100004	11	70

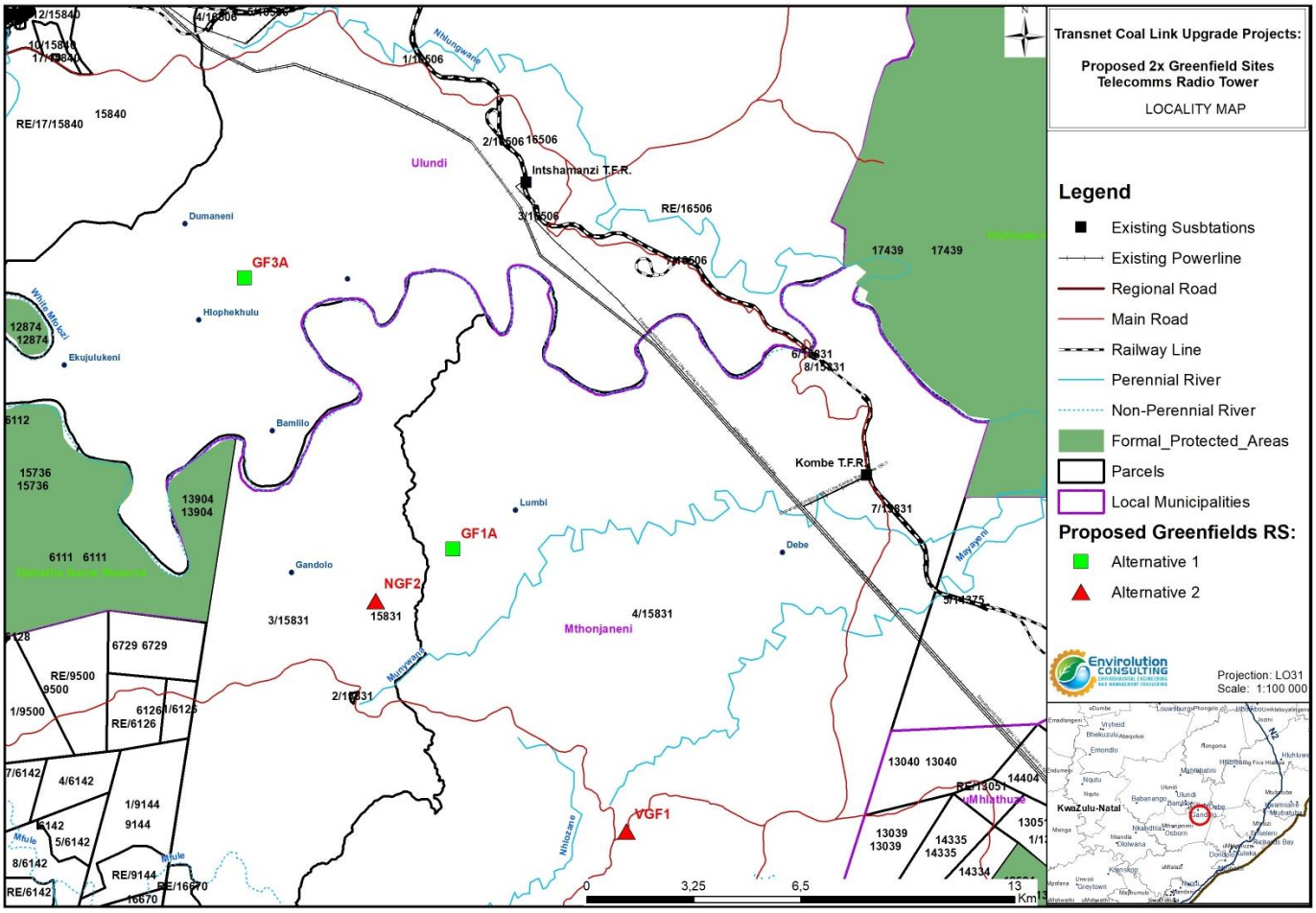

Figure 3: Map showing the proposed Greenfield Sites Telecommunication Radio Tower property details

2.2 Technical Details

The proposed development entails the **construction of 2x Greenfield Sites** as per the following pairs:

NGF2	VGF1
• Lattice tower • Proposed height: 65m • Size of site: 30m x 30m	• Lattice tower • Proposed height:70 • Size of site: 30m x 30m

OR

Greenfield 1A	Greenfield 3A
• Lattice tower • Proposed height: 80m • Size of site: 30m x 30m	• Lattice tower • Proposed height: 80m • Size of site: 30m x 30m

Figure 4: Feasible Greenfield Sites pairs

In addition:

- The sites will be 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.

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 Line of Site (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. Four Greenfield sites as highlighted on **Table 1** were feasible due to the direct LOS to existing Eskom sites and Duma, power close by.

The Feasible Greenfield Alternative Sites investigated are as follows:

Alternative 1: Greenfield 1A and Greenfield 3A
OR
Alternative 2: NGF2 and VGF1

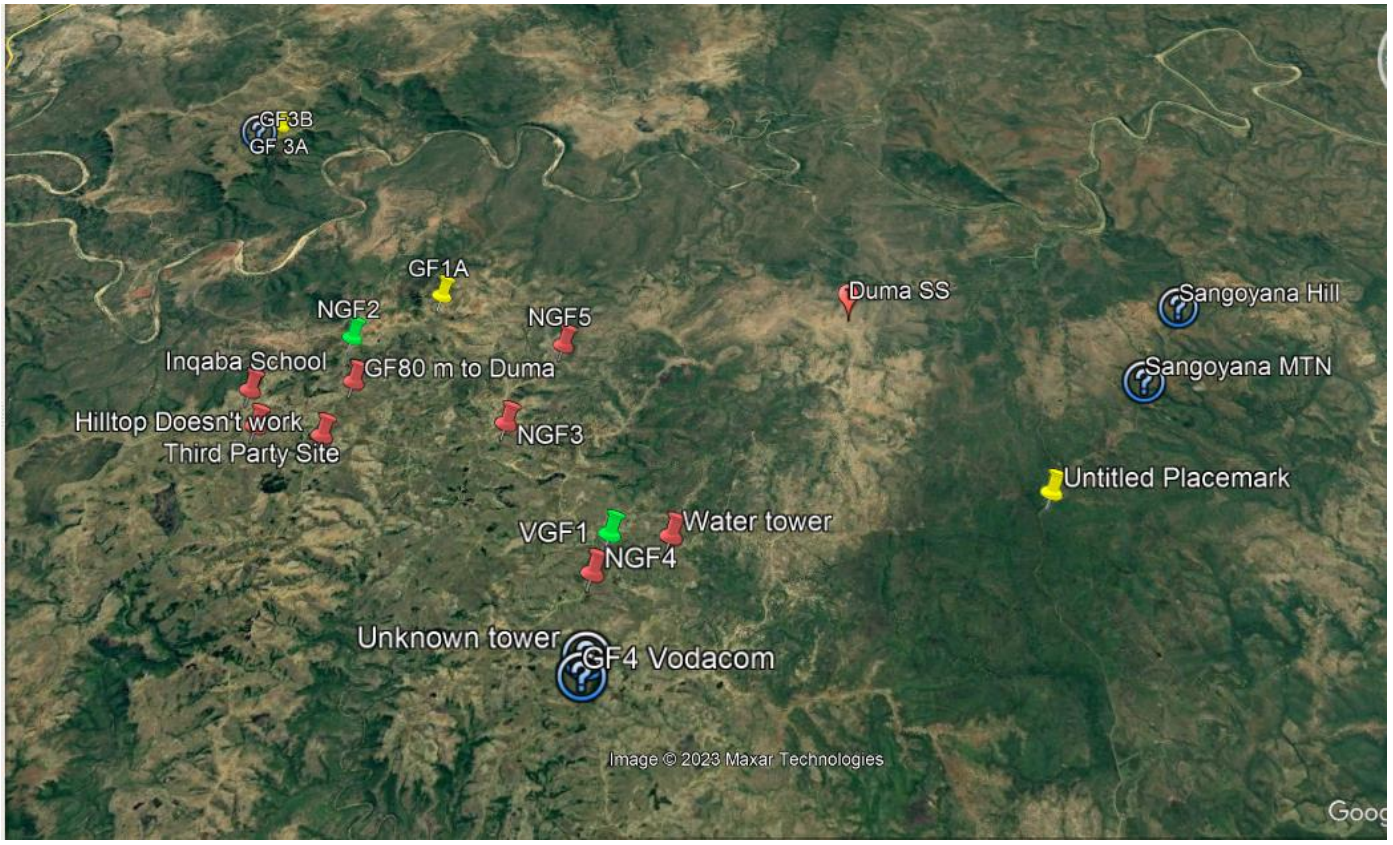

Figure 5: Telecoms Site alternative investigations

Table 1: Transnet Freight Rail Project - Telecomms Site investigations

#	Site Visited	Latitude	Longitude	Comments
1	GF1	28°27'7.94"S	31°34'53.05"E	Terrain not conducive for building new site
2	GF1 Yangue	28°27'4.10"S	31°35'4.30"E	Cultural site (prayer/grave)
3	Greenfield 1A	28°27'3.24"S	31°34'57.55"E	LOS to existing Eskom sites and Duma
4	GF2	28°29'32.00"S	31°38'25.00"E	Terrain not conducive for building new site
5	GF4	28°30'53.43"S	31°38'57.94"E	same vicinity as GF5 no power close by, terrain is sloped
6	GF5	28°30'51.30"S	31°38'57.70"E	No power close by, terrain is sloped
7	GF7	28°31'0.01"S	31°39'24.20"E	No power infrastructure, on dirt road
8	NGF1	28°34'9.00"S	31°27'39.00"E	No LOS
9	NGF2	28°27'56.43"S	31°33'32.24"E	LOS to existing Eskom sites and Duma, power close by
10	Greenfield 3A	28°22'40.34"S	31°30'58.22"E	LOS to existing Eskom sites and Duma
11	GF3B	28°22'59.10"S	31°30'40.50"E	Terrain not conducive for building new site
12	VGF1	28°31'38.15"S	31°38'17.87"E	LOS to existing Eskom sites and Duma, power close by
13	NGF4	28°32'16.00"S	31°38'5.00"E	Terrain not conducive for building new site
14	Unkown Tower	28°33'34.40"S	31°38'11.70"E	No LOS and not an option due to critical services
15	GF4 Vodacom	28°33'51.80"S	31°38'9.10"E	No LOS and not an option due to critical services
16	Sangoyana Hill	28°27'32.60"S	31°48'8.70"E	power infrastrucure end at the botom of hill, road access not good
17	Sangoyana MTN	28°29'4.00"S	31°47'12.00"E	no space at site for new site to be established. LOS to only Duma
18	Inqaba School	28°28'59.70"S	31°32'2.10"E	No LOS and not an option due to critical services
19	Third party site	28°29'41.34"S	31°32'18.77"E	No LOS and not an option due to critical services
20	GF80m to Duma	28°28'51.00"S	31°33'45.21"E	No LOS to existing Eskom sites and and at least 80m tower for Duma
21	Water tower	28°31'41.02"S	31°39'14.76"E	Terrain not conducive for building new site
22	Untitled Placemark	28°30'44.82"S	31°45'1.01"E	Terrain not conducive for building new site, no power, no LOS
23	Untitled Placemark	28°30'59.77"S	31°45'13.07"E	Terrain not conducive for building new site, no power, no LOS
24	Untitled Placemark	28°31'17.05"S	31°43'15.10"E	Terrain not conducive for building new site, no power, no LOS

2.3.2 **Design/Layout alternative**

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. The preferred tower type by Eskom is a self-supporting steel lattice tower (**Figure 6** for example).

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.

Preferred Alternative: *Eskom has moved away from monopole towers type as it is very difficult to maintain during its lifetime. Eskom 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. Eskom have also found that Lattice structures are more robust and durable for our network needs*

Figure 6: Typical telecom tower

2.3.3 **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 communication services for its infrastructures it is imperative that there are reliable and effective communications systems in place to provide the necessary services to the substation.

In addition, these 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 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 30mx30m, but its vertical dimension reaches 65m/80m dependant on which alternative pair is constructed. 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;
- 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 an 65 & 70m for NGF2 and VGF1 OR an 80m Greenfield 1A and Greenfield 3A 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 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 2** 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 2: 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	The mast will be 65 & 75m /80m in height, thereby exceeding the 15m threshold, and falls within Sensitive areas as identified in an environmental management framework.
Activity 12 of Listing Notice 3 (GNR 324, 07 April 2017): The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan **(d) Kwazulu-Natal:** xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority	The mast will require an area of 30m x30m i.e. 900 square metres clearance of indigenous vegetation within Sensitive areas as identified in an environmental management framework.

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 3**, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 3: 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 use. This***	Department of Water and Sanitation (DWS)

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	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 30m x 30m 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 invader plants.	DFFE KZN EDTEA

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	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 throughout the life cycle of the project.***	DFFE

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
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 4 below details how the legal requirements of **APPENDIX 1** of the 2014 EIA Regulations **(as amended, GNR326)** have been addressed within this report.

Table 4: 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— **(a)** details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Appendix G1
(b) the location of the activity, including: i. the 21 digit Surveyor General code of each cadastral land parcel; ii. where available, the physical address and farm name; iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Appendix G3
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Appendix A & Appendix G3
(d) a description of the scope of the proposed activity, including— i. all listed and specified activities triggered and being applied for; and ii a description of the activities to be undertaken including associated structures and infrastructure;	Section 3.1 Section 2.2
(e) a description of the policy and legislative context within which the development is proposed including— 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;	Section 3.2
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 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. 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;	i. Section 2.4 ii. Chapter 4 & Appendix D 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

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;	
(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 (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 8 (section 8.4)
(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[1]; 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 5**).

Table 5: Key stakeholder groups identified during the EIA Process

Department of Environment, Forestry & Fisheries	National	Biodiversity Directorate	Seoka Lekota
South African Civil Aviation Authority	National	Obstacle Specialist	Lizell Stroh
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	Head of Department	Muziwandile Mdamba
KZN Department of Economic Development, Tourism and Environmental Affairs (Zululand District Municipality)	Provincial Authority	Head of Department	Sbusiso Ndwande
KZN Department of Economic Development, Tourism and Environmental Affairs (King Cetshwayo District Municipality)	Provincial Authority		Simphiwe Mbiko/ Nokukhanya Ndlazi
Ezemvelo KZN Wildlife	Provincial Authority		Nerissa Pillay Noluthando Dlamini
Department of Water & Sanitation (Pongola-Umzimkulu WMA)	Provincial Authority	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	Thembalakhe Sibozana
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
KZN: COGTA (Zululand District)	Provincial Authority	Deputy Director:	
King Cetshwayo District Municipality	Local Authority	Executive Mayor:	Cllr Thembeka Mncunu,
King Cetshwayo District Municipality	Local Authority	Municipal Manager:	MRS M NDLOVU
King Cetshwayo District Municipality	Local Authority	DMM: Community Services	Mrs TF Mngun
King Cetshwayo District Municipality	Local Authority	DMM: Technical Services	Mr CK M'maretel
Zululand District Municipality	Local Authority	Development Planning Dept	Stefan Landman BP Mnguni
Zululand District Municipality	Local Authority	Municipal Manager:	Mr Ntokozo Hlongwa
Zululand District Municipality	Local Authority	Speaker Office	Cllr DT Memela
Mthonjaneni Local Municipality	Local Authority	Municipal Manager:	Mr ZS Mthethwa
Mthonjaneni Local Municipality	Local Authority	Mayor	Cllr – Mbangiseni 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 1	Cllr M.N Biyela
Mthonjaneni Local Municipality	Local Authority	Ward 11	Cllr D.F Xulu
Mthonjaneni Local Municipality	Local Authority	Ward 12	Cllr. Wellington Nsele
Ulundi Local Municipality	Local Authority	Municipal Manager:	Mr S M Khomo
Ulundi Local Municipality	Local Authority	Office of the Mayor	Cllr WM Ntshangase
Ulundi Local Municipality	Local Authority	Environmental Management	Mr Maluleki Agrian
Ulundi Local Municipality	Local Authority	Speaker Office	
Ulundi Local Municipality	Local Authority	Ward 24	Cllr V Nxumalo
Ulundi Local Municipality	Local Authority	Palanning & Development Service	Mr Richard Mazibuko
Obuka Traditional Council	Local Authority	Traditional Authority	PC Biyela
KwaXimba Traditional Council (GF3A)	Local Authority	Traditional Authority	MP Mlaba
XIMBA 16506	RE	Ingonyama Trust	Suewellan Ellis
Wildlife and Environment Society of South Africa (WESSA)	Interested & Affected Parties	WESSA: DURBAN	ADMINISTRATOR
Ingonyama Trust	Interested & Affected Parties	Town & Regional Planner	Tashveer Bothath

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 was publicly made available to all registered I&AP's from **23 June 2023 to 24 July 2023** at the following places:

- **MELMOTH & ULUNDI 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
- Zululand District Municipality
- Mthonjaneni Local Municipality
- Ulundi 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, a 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 have been integrated into the Issues and Responses Report. 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).

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 7**). 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 is classified as the Zululand Lowveld vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2018)). which consists of tall grasslands mostly found on the higher mountains and plateaus, and savannah grasslands to bushveld thickets in the valleys and lower plains.

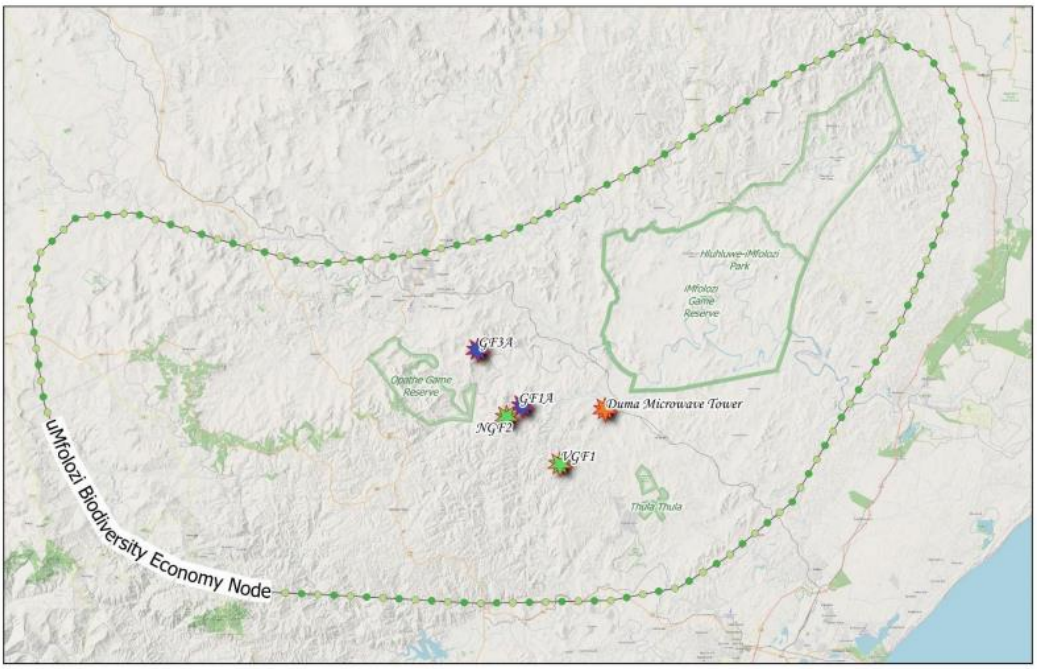

Figure 7: uMfolozi Biodiversity Economy Node

The study area is considered natural/rural with a sparse network of roads leading to widely distributed settlements and villages. The villages 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. No

major roads are present in the study area besides a sparse gravel road network that connects to the widely distributed villages. The P700 and R34 are the only nearby tar roads that provide linkages to the larger towns in the area.

The Ophathe Game Reserve is located in the western part of the study area, and the Hluhluwe-iMfolozi Park (HiP) towards the east, connected by the meandering White-iMfolozi River. The Ophathe Game Reserve is fenced and according to the Protected Area Management Plan (2016), the main infrastructure development is located in the north-western part of the reserve, outside of the study area. Limited information is available on the reserve, but it appears to not have overnight accommodation facilities and nearly inaccessible roads due to neglect. As far as a desktop research exercise could deliver, the reserve appears to be in a poor condition and is seldom visited by tourists. However, it possesses the potential for more tourist activity and is considered important in terms of the UBEN planning. The park's eastern boundary is approximately 5 km from the nearest tower locations namely GF3A and NGF2. The HiP's southern boundary is located approximately 12km to the northeast of the nearest tower site, i.e., VGF1. The park is considered a major tourist attraction and occupies approximately 960km². 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 . According to the viewshed analyses for GF1 & VGF1, the southwestern corner of the park overlaps with the outer reaches of the ZVI and is considered outside of the detection zone. The study area is largely undeveloped with the exception of the scattered rural villages and a sparse road network 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 natural grasslands, wooded valleys and panoramic views are pleasant and contributes to a high visual quality. The mountains provide visual variation and contributes to the visual quality. The White-iMfolozi River, meanders through the mountains and has carved a shallow canyon through the landscape. This is considered an exceptional feature in the study area.

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 months of December and January at 106 mm and lowest in the month of June at 11 mm of rainfall. About, 587 mm, or 83.86% of the annual average rainfall of 700 mm falls in the summer growing season (September to March). The mean monthly temperature is highest in January at 23.6oC and the mean monthly temperature is lowest at 15.5oC in the month of July.

5.2.2 Topography and Geology

The natural topography is considered mountainous with an elevational range of between 900m and 100m. The topography consists of rounded consolidated mountain ranges and deep depressions in the landscape following the path of the rivers and streams. A general downward slope occurs from the west to the east, in the direction of the White-iMfolozi River where the topography evens out to an undulating landscape. The tower sites are located on some of the highest points in the landscape (**Figure 8**). The following table provides the approximate height above sea level for each location.

Tower heights above sea level

GF3A	835m
NGF2	756m
GF1A	716m
VGF1	579m

Due to the elevated location of the sites and the height of the proposed towers, it is expected to have an extended ZVI. The mountainous topography is expected to provide a medium screening potential and creates a fractured visibility pattern. Large areas of complete screening or highly fractured visibility can be noticed on all four sites.

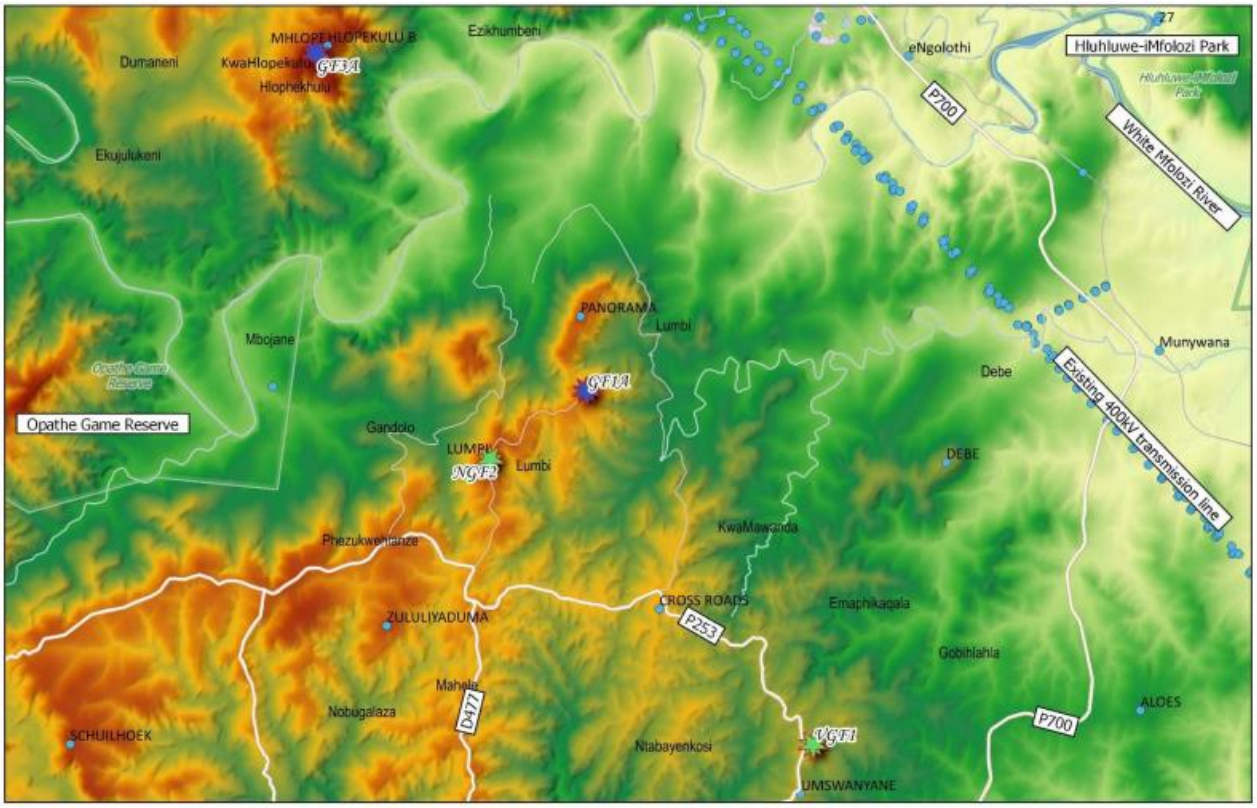

Figure 8: Regional elevation map

5.2.3 Soils

- **Greenfield 1A:** The project site falls under the land class type Fa119 which comprises of soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. 3.5% of soils under the Fa119 soil classification can be classified as Rocks, while 39.3% can be classified as Williamson Gs16, Trevanian Gs17, 29.9% as Mispah Ms10, 12.4% as Swartland Sw31, Rosehill Sw30, etc. The soils have clay content varying between 5% and 35% with the average clay content of the site at 22.4%. The vegetation of Greenfield Tower Site 1A 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 few homesteads.

- **Greenfield 3A**: The project site falls under the land class type Fa118 which comprises of soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. 10.5% of soils under the Fa118 soil classification can be classified as Rocks, while 32.3% can be classified as Williamson Gs16, Platt Gs14, Trevanian Gs17, 27.8% as Mispah Ms10, 10.3% as Rutherglen Cf11, Cartref Cf21, Waterridge Cf20, 9.5% as Swartland Sw31, etc. The soils have clay content varying between 8% and 90% with the average clay content of the site at 20.9%. The soil depth of the area varies between 200mm and 800mm with the average depth of the site at 314mm. The vegetation of Greenfield Tower Site 3A 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 few homesteads as shown below.

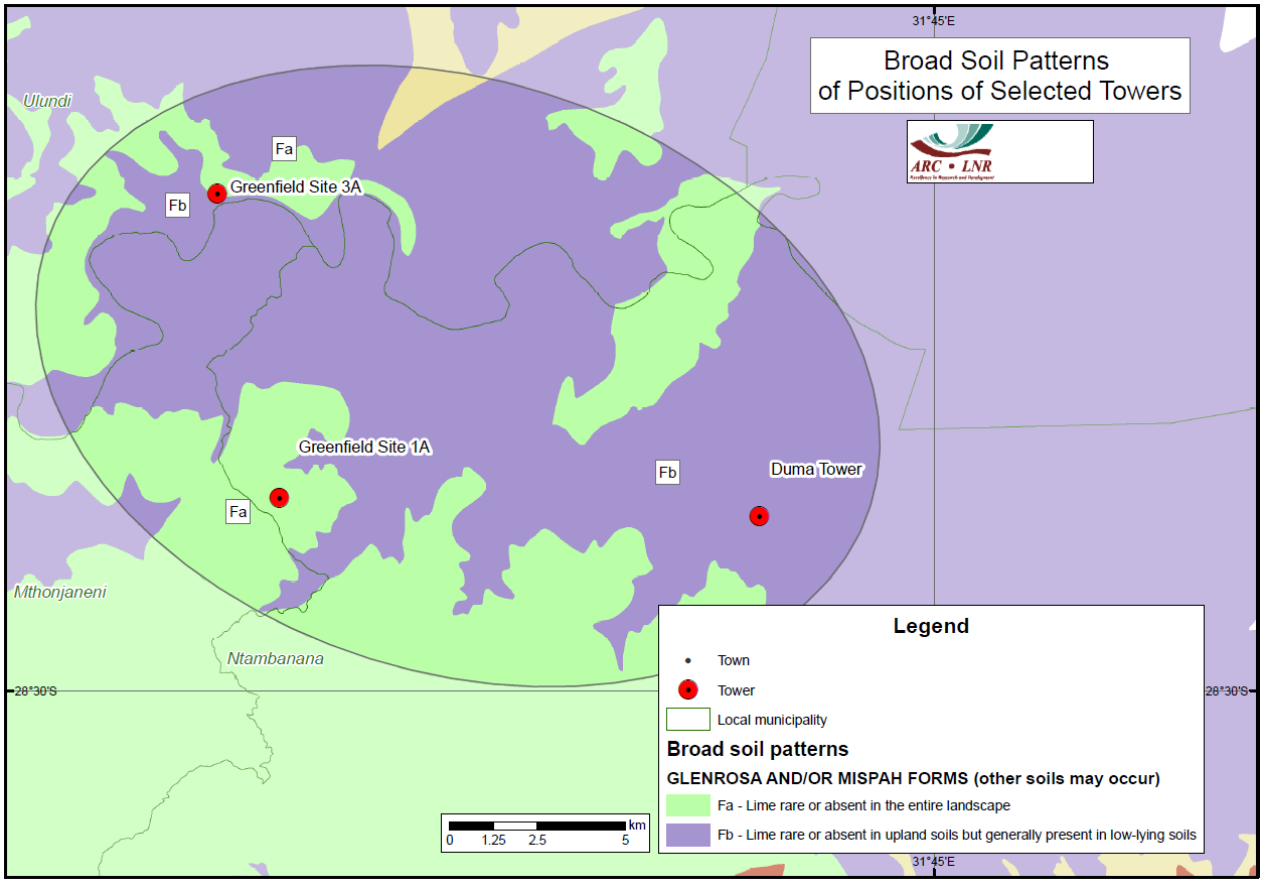

Figure 9: Soil Classification of the tower study area

- **Greenfield NGF 2** & **VGF 1:** The project sites fall under the land class type Fa119 which comprises of soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. 3.5% of soils under the Fa119 soil classification can be classified as Rocks, while 39.3% can be classified as Williamson Gs16, Trevanian Gs17, 29.9% as Mispah Ms10, 12.4% as Swartland Sw31, Rosehill Sw30, etc. The soils have clay content varying between 5% and 35% with the average clay content of the site at 22.4%. The soil depth of the area varies between 200mm and 1200mm with the average depth of the site at 362.9mm. The Agricultural Research Council (ARC) in South Africa has identified the Fa soil type as a land type class that is characterized by shallow, poorly developed soils that are typically found on hard or weathering rock, and they may be interspersed with intermittent, diverse soils.

5.3 Water Resources of the study area

5.3.1 Drainage and River Setting

Alternative 1: GF1A and GF3A: The GF1A tower site is located on a small hilltop. According to the national quaternary catchment dataset, the site is located within catchment W21L that is drained by the perennial White Imfolozi River. The hilltop is located along the catchment divide between quaternary catchments W21L and W21K. The tower site and associated gentle slopes drain into a small ephemeral headwater stream located approximately 108m downslope and west of the tower. The ephemeral stream grades into a larger seasonal stream that ultimately drains into the Munywana River which is a right-bank tributary of the White Imfolozi River (**Figure 10**).

The GF3A tower site is located on a hilltop that forms part of a ridgeline and catchment divide. According to the national quaternary catchment dataset, the site is located within catchment W21K that is drained by the perennial White Imfolozi River. The hilltop on top of which the tower will be located drains in both north-easterly and south-westerly directions. The north-east facing slopes drain into a small ephemeral headwater stream that is a left-bank tributary of the Dumaneni River, which is in turn a left-bank tributary of the White Imfolozi River. The south-wetern slopes drains into a small first order ephemeral headwater stream located approximately 400m downslope and south-west of the tower. The ephemeral stream is a left-bank tributary of the White Imfolozi River (**Figure 11**).

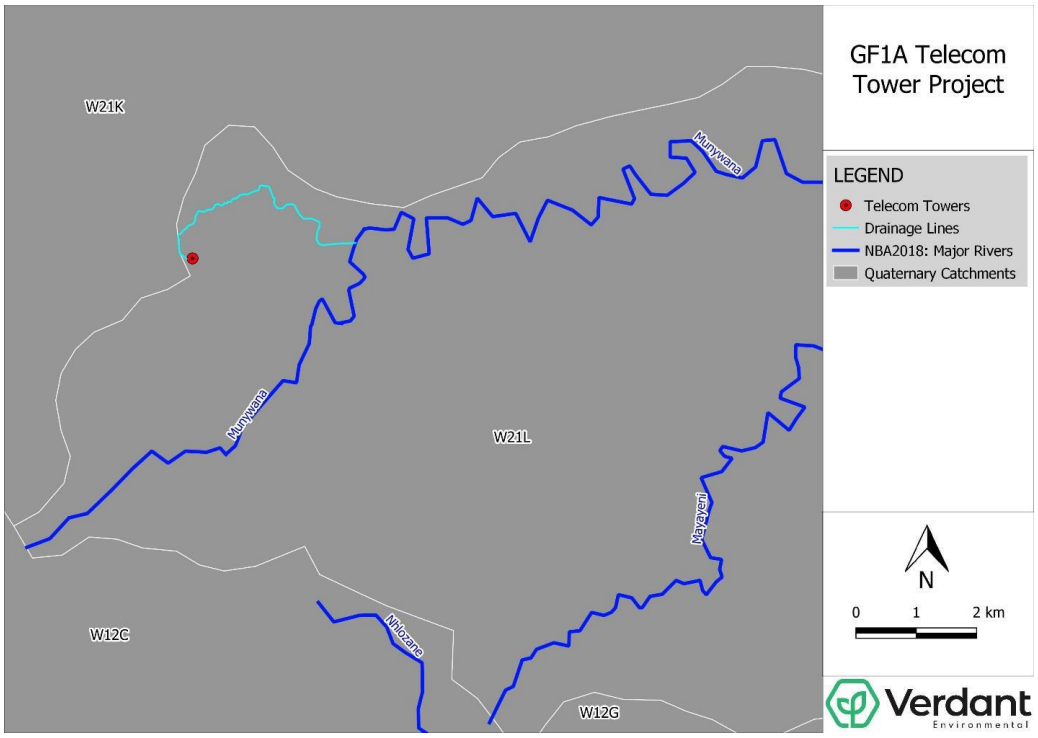

Figure 10: Drainage and river ecosystem setting of the study area.

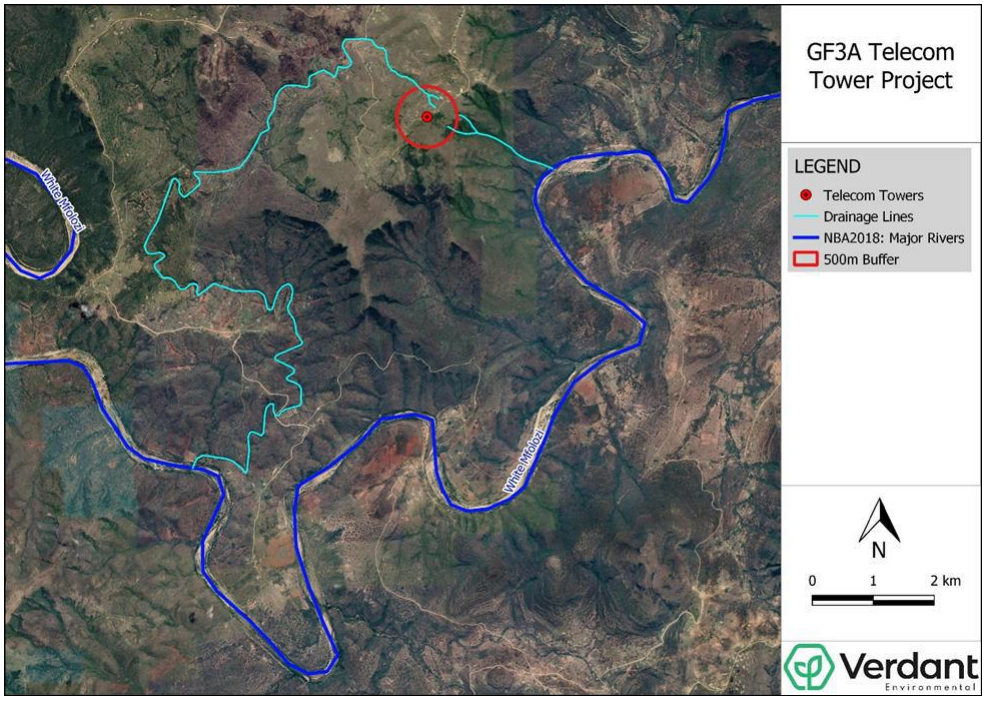

Figure 11: Drainage setting of the GF3A study area.

Alternative 2: NGF2 and VGF1

The NGF2 tower site is located on a hilltop. According to the national quaternary catchment dataset, the site is located within catchment W21K that is drained by the perennial White Mfolozi River. However, the hilltop is located along the catchment divide between quaternary catchments W21K and W21L and based on the contour data available the site actually falls within quaternary catchment W21L. Quaternary catchment W21L is also ultimately drained by the perennial White Mfolozi River. The tower site and associated moderately steep to steep slopes drain into a seep 83m downslope and south-east of the tower and one small ephemeral headwater stream located approximately 130m downslope and east of the tower. The seep grades into an ephemeral stream downslope and both ephemeral streams then grade into a larger seasonal stream. The seasonal stream drains into the Munywana River ~2.3km downstream which meets the larger White Mfolozi River ~ 34km downstream of the tower site (Figure 12)

The VGF1 tower site is located on a hilltop. According to the national quaternary catchment dataset, the site is located within catchment W12G that is drained by the perennial Nseleni River. The hilltop is located along the catchment divide between quaternary catchments W12G and W12C. The tower site and associated moderately steep to steep slopes drain into a small ephemeral headwater stream located approximately 125m downslope and southeast of the tower. The ephemeral stream grades into a larger seasonal stream which ultimately drains into the Nseleni River ~2.6km downstream (Figure 13).

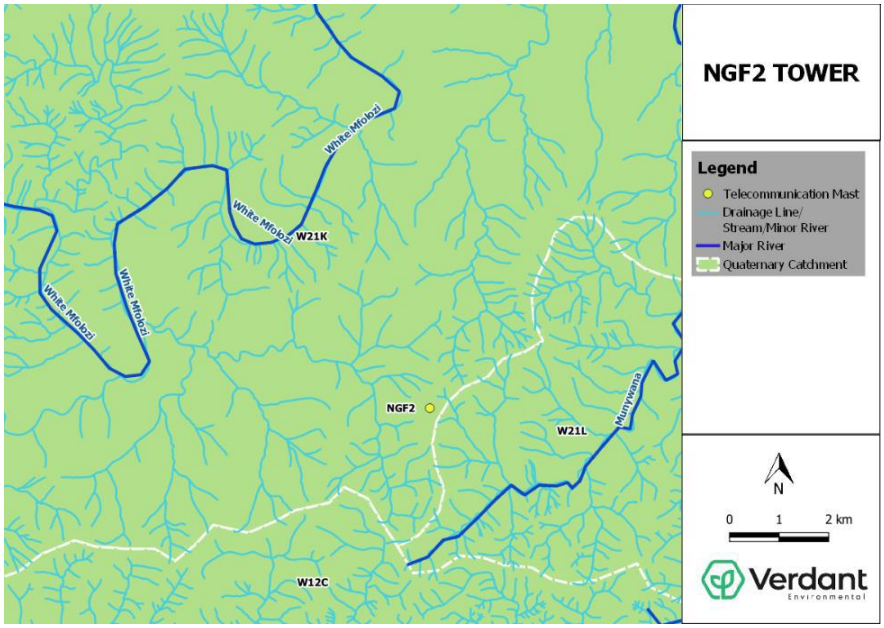

Figure 12: Drainage setting of the NGF2 tower site.

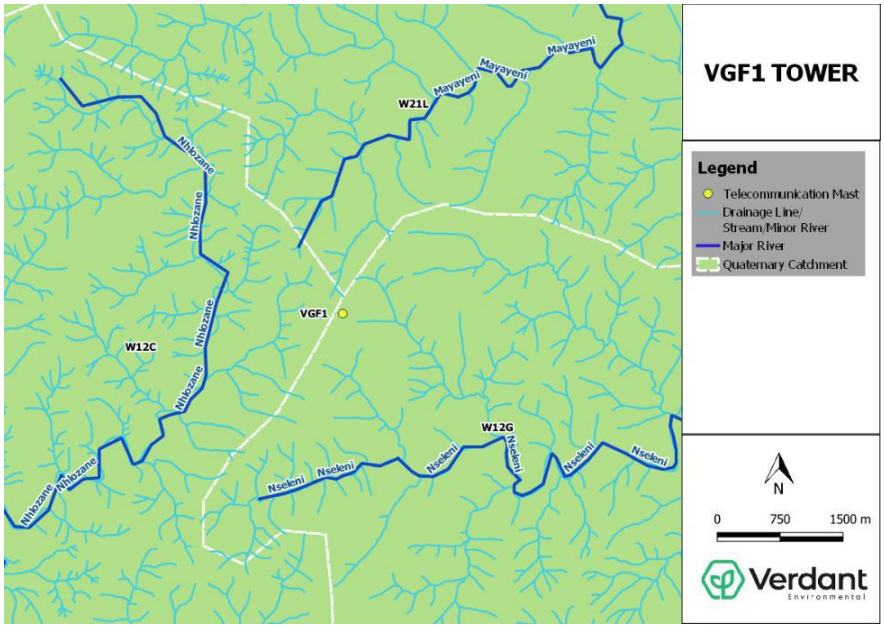

Figure 13: Drainage setting of the VGF1 study site.

5.3.2 National Wetland Mapping

Alternative 1: GF1A and GF3A

For the GF1A study area, in terms of the National Wetland Map Version 5, a single wetland has been modelled to occur 312m south-west of the tower site as shown in Figure 12 below. In terms of the National Freshwater Ecosystem Priority Areas (NFEPA) Project wetland inventory (CSIR, 2011), a large wetland has been modelled to occur 280m west of the tower site. For the GF3A study area, in terms of the National Wetland Map Version 5 and the National Freshwater Ecosystem Priority Areas (NFEPA) Project wetland inventory (CSIR, 2011), no wetlands have been modelled to occur within 500m of the proposed tower..

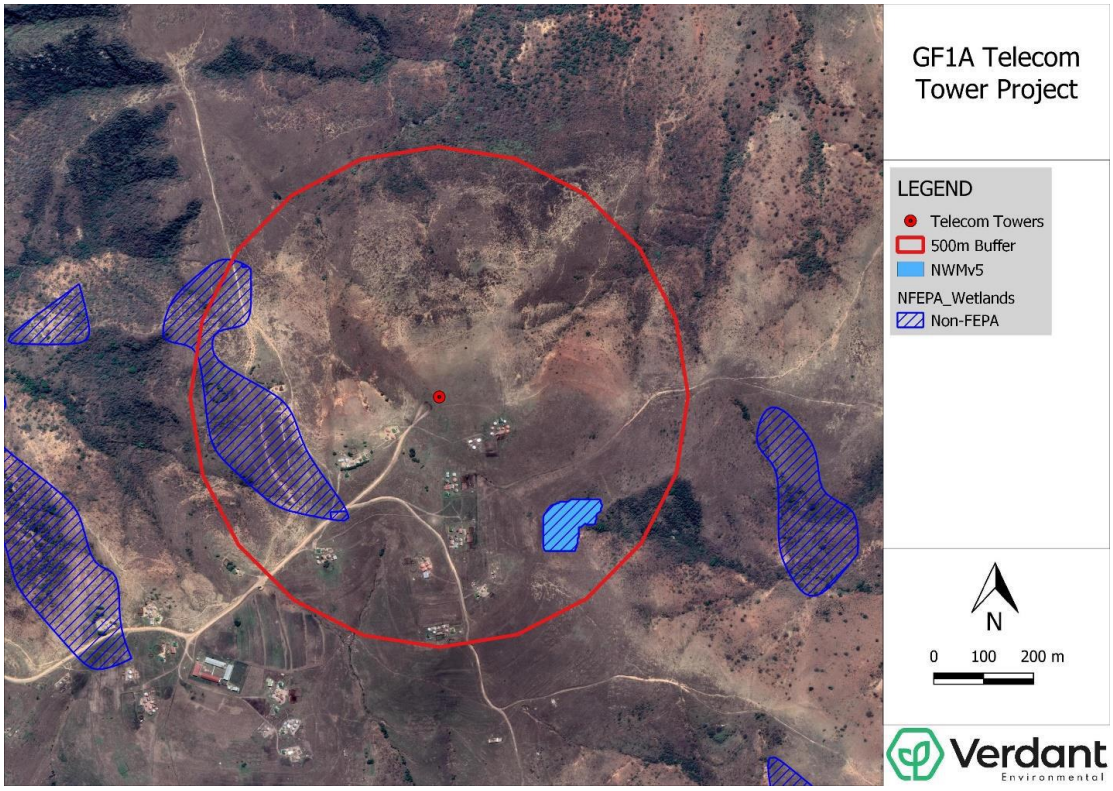

Figure 14: National wetland modelling for the study area of GF1A

Alternative 2: NGF2 and VGF1

For the NGF2 study area, in terms of the National Wetland Map Version 5, no wetlands are modelled to occur within a 500m radius of the project site. A seep wetland of the Lowveld Bioregion has been modelled to occur 645m due south of the tower site (**Figure 15**). In terms of the National Freshwater Ecosystem Priority Areas (NFEPA) Project wetland inventory (CSIR, 2011), no wetlands are modelled to occur within a 500m radius of the project site although a non-FEPA wetland flat is modelled to occur ~1.3km north-east of the site. For the VGF1 study area, in terms of the National Wetland Map Version 5, no wetlands are modelled to occur within a 1km radius of the project site. In terms of the National Freshwater Ecosystem Priority Areas (NFEPA) Project wetland inventory (CSIR, 2011), no wetlands are modelled to occur within a 1km radius of the project site.

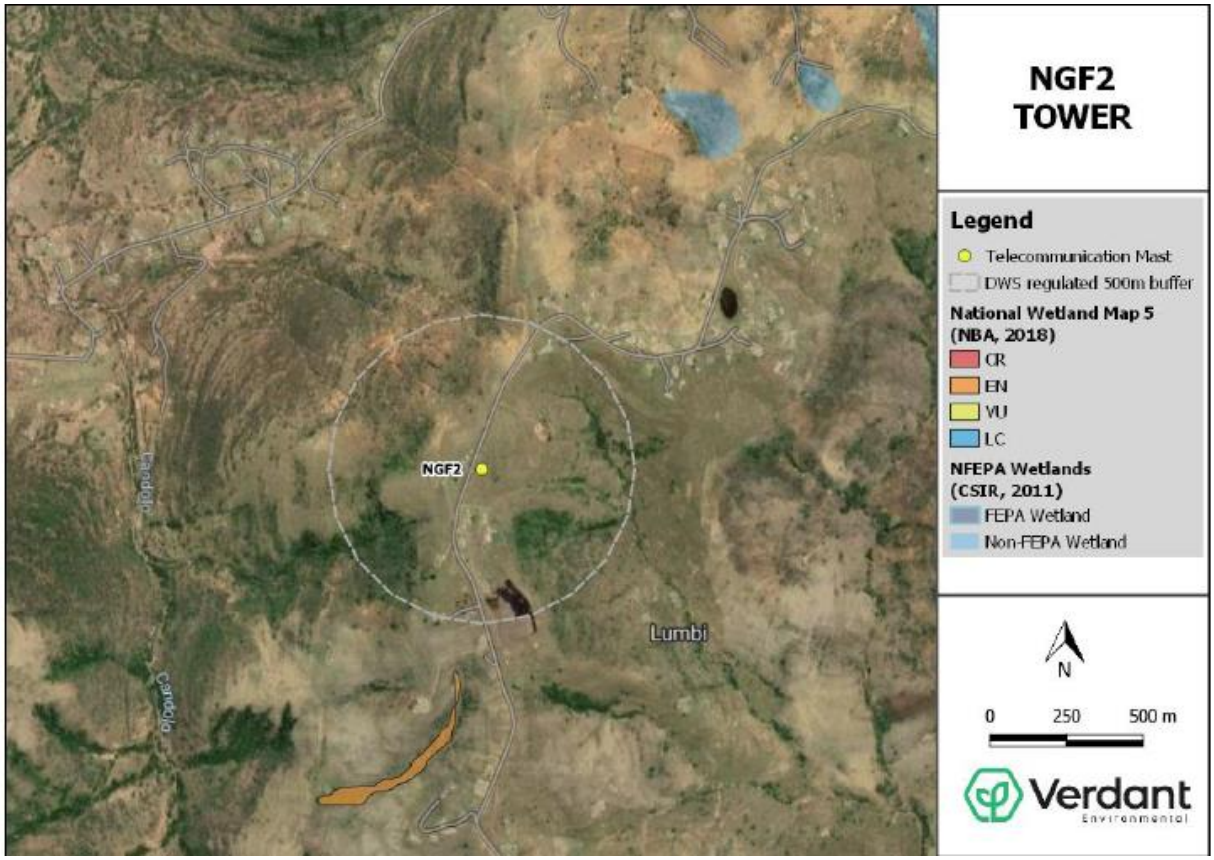

Figure 15: National wetland modelling for the study area (NGF2)

5.4 **Terrestrial Biodiversity**

5.4.1 Vegetation Overview:

- The reference vegetation for the **GF3A tower** is mapped as **Northern Zululand Sourveld** in the National Vegetation Map (Mucina & Rutherford 2006, p. 505). These authors remark that: "*It occurs from Swaziland in scattered patches into northern Zululand in the surrounds of Hlomohlomo, east of Louwsburg, Nongoma and the vicinity of Ulundi including Nkandla. In the Hluhluwe-iMfolozi Park it occurs at highest altitudes in the park. Altitude mainly 450– 900 m.* Northern Zululand Sourveld has the threat status of Least Concern; however, it is poorly protected and the amount of endemism is uncertain (Skowno et al. 2018).
- The reference vegetation for both **GF1A and NGF2** 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. 2018) and it is moderately protected.
- The reference vegetation for **VGF1** is shown in National Vegetation Mapping (SANBI, 2018) as **Moist Coast Hinterland Grassland** (Mucina & Rutherford 2006, p. 510 & 511). Moist Coast Hinterland Grassland is distributed on the coastal escarpment (400–900 m. a. s. l.) between Libode in the Eastern Cape and Melmoth in KwaZulu-Natal and was formerly described as part of the broader Ngongoni Veld vegetation type which has been separated into Dry and Moist Coast Hinterland Grassland variants. It is described as: "*Dense, tall grassland overwhelmingly*

dominated by unpalatable, wiry Ngongoni grass (Aristida junciformis) with this monodominance associated with low species diversity." (Mucina and Rutherford, 2006).

5.4.2 Conservation Context:

- **GF1A Tower**: The site itself is not located within any Critical Biodiversity Area3, however, a large Critical Biodiversity Area: Irreplaceable is located 140m to the east of the site as defined in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015). The site itself is not located within any Ecological Support Area (ESA) or macro ecological corridor, however, a large ESA surrounds the site and is located 85-140m from the site as defined in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 16**). A summary of the conservation planning and threat status of the ecological features in the study area is provided in **Table 6**.

Table 6. Key conservation context details for the GF1A tower 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	Available	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		CBA: Irreplaceable	CBA: Irreplaceable	140m east of the study area
		ESA	ESA	85m west of the study area

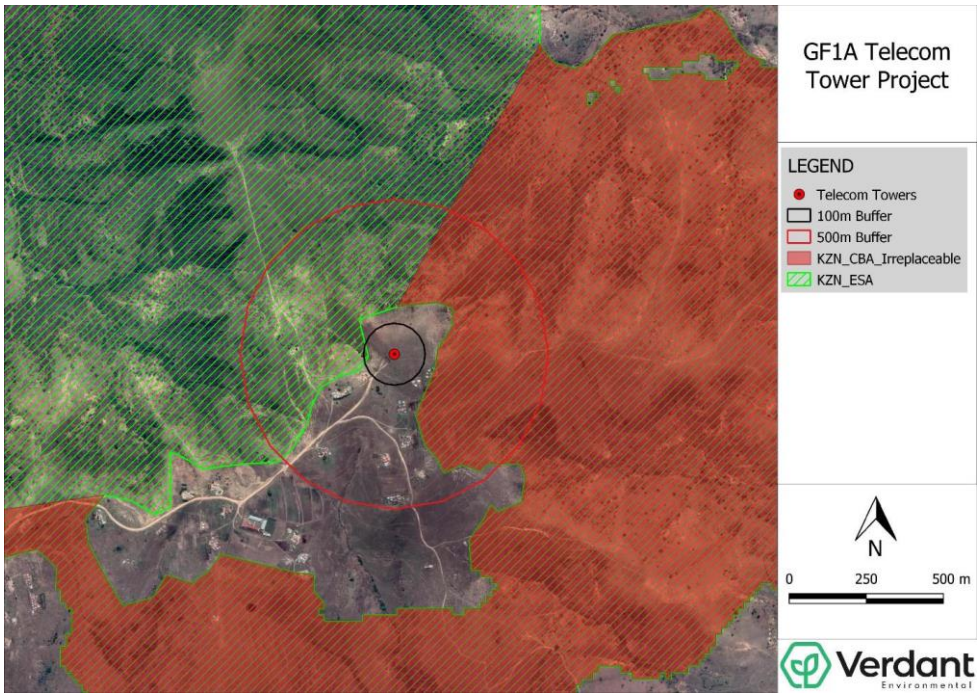

Figure 16: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to GF1A tower study area.

- GF3A Tower: The site is not located within any Critical Biodiversity Area4 or Ecological Support Area (ESA) as defined in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 17**). A summary of the conservation planning and threat status of the ecological features in the GF3A tower study area is provided in **Table 7**;

Table 7: Key conservation context details for the GF3A tower 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 3080	Upstream Management Area	Entire study area
2018 National Biodiversity Assessment (SANBI, 2018)	Terrestrial	Northern Zululand Sourveld	Least Concern	Entire study area
	Rivers	White Imfolozi River	Least Threatened	±1.9km 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)		Northern Zululand Sourveld	Vulnerable	Entire study area
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 1920	Earmarked	Entire project site
		CBA: Irreplaceable	CBA: Irreplaceable	1km north-east of the study area

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT			
Conservation Planning Dataset	**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)	ESA	ESA	2.4km south of the study area

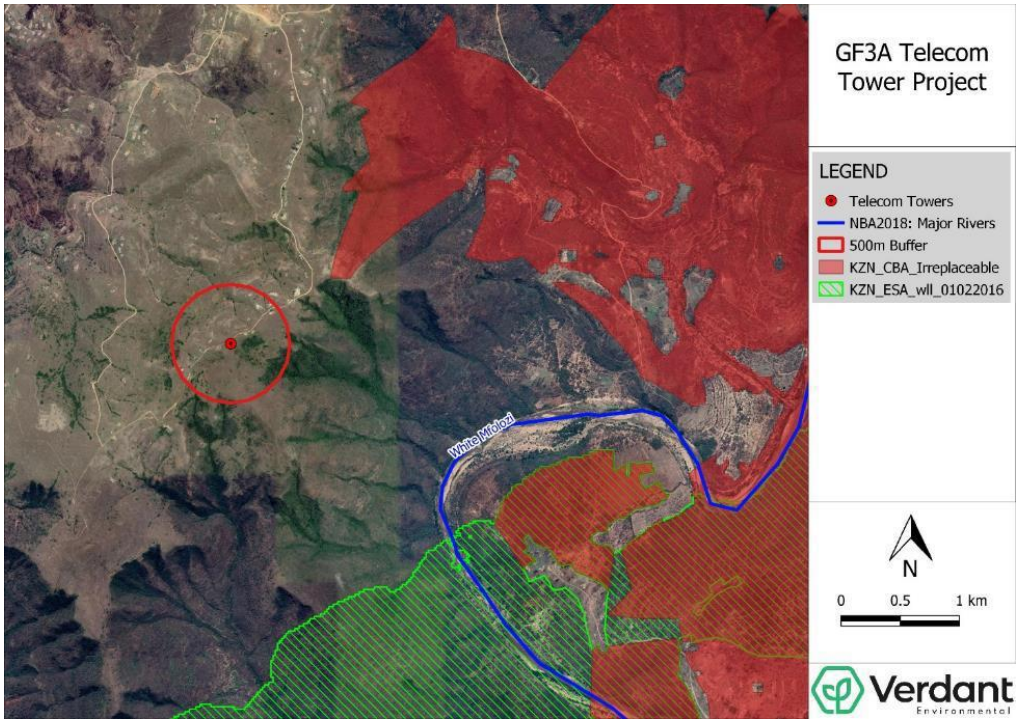

Figure 17: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to GF3A tower study area.

- **VGF1 Tower**: The site itself is located within a Critical Biodiversity Area5: Optimal and 150m to the west is a large Critical Biodiversity Area: Irreplaceable as defined in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 18**). The site is located 30m south of an area flagged as part of the KZN Protected Area 20-year

Expansion Strategy. A summary of the conservation planning and threat status of the ecological features in the study area is provided in **Table 8**.

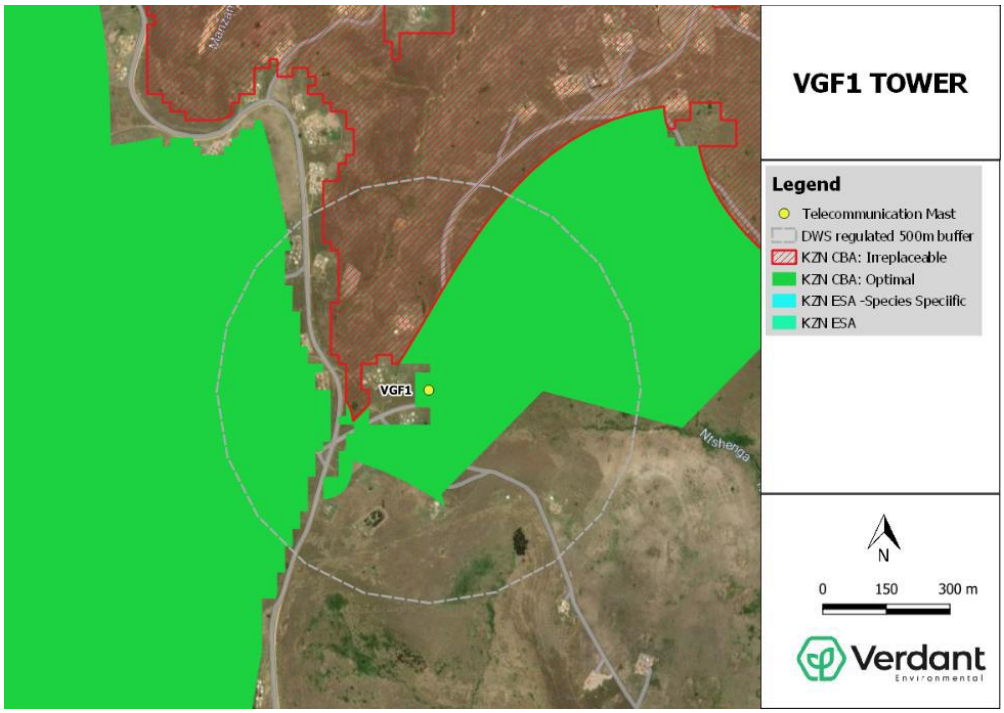

Figure 18: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to VGF1 tower study area.

Table 8: Key conservation context details for the VGF1 tower 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 3229	Upstream Management Area	Entire study area
2018 National Biodiversity Assessment (SANBI, 2018)	Terrestrial	Moist Coast Hinterland Grassland	Vulnerable	Entire study area
	Rivers	Nseleni River	Least Threatened	±2.6 km downstream
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
KZN Vegetation Map Threat Assessment (Jewitt, 2018)		Moist Coast Hinterland Grassland	Endangered	Entire study area
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 1635	Available	Entire project site
		CBA: Irreplaceable	CBA: Irreplaceable	150m to the west

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT			
Conservation Planning Dataset	**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)	CBA: Optimal	CBA: Optimal	Entire project site

- NGF2 Tower: The site itself is located 340m south of a Critical Biodiversity Area6: Irreplaceable and 340m south of an Ecological Support Area as defined in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 19**). A summary of the conservation planning and threat status of the ecological features in the study area is provided in **Table 9.**

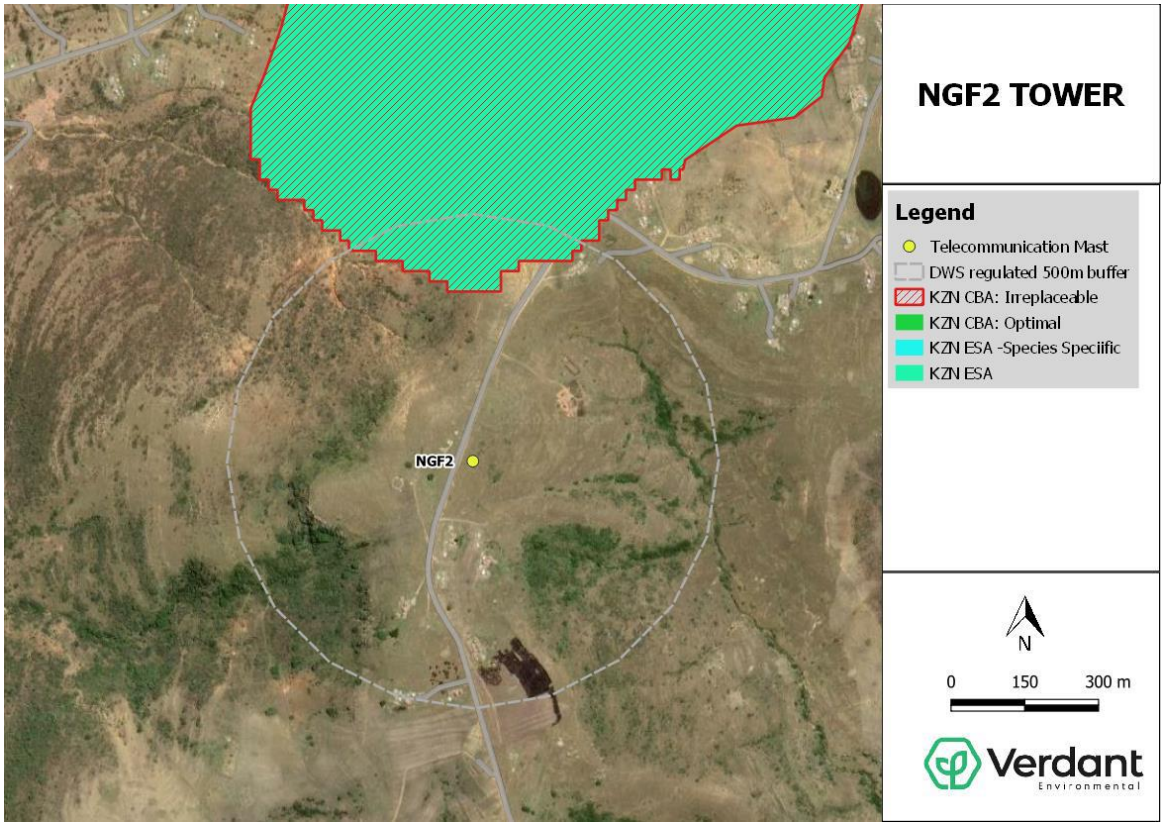

Figure 19: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to NGF2 tower study area.

Table 9: Key conservation context details for the NGF2 tower study area.

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
National Protected Area Expansion Strategy (SANPARKS & SANBI, 2010)		National Protected Area Expansion Area	National Protected Area Expansion Area	8.3km west of the site
National Freshwater Ecosystem Priority Areas (NFEPA) (CSIR, 2011)	Rivers	Catchment Planning Unit 3080	Upstream Management Area	Entire study area
2018 National Biodiversity	Terrestrial	Zululand Lowveld	Least Threatened	Entire study area

NATIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
Assessment (SANBI, 2018)	Rivers	Munywana River	Least Threatened	±2.3 km downstream
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
KZN Protected Area Expansion Strategy (EKZNW, 2010)		KZN Protected Area Expansion Area	KZN Protected Area Expansion Area	4km west of the study area
KZN Vegetation Map Threat Assessment (Jewitt, 2018)		Zululand Lowveld	Vulnerable	Entire study area
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 1627	Available	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		Critical Biodiversity Area: Irreplaceable	CBA: Irreplaceable	340m to the north
		Ecological Support Area	Ecological Support Area	340m to the north

5.4.3 Description of Vegetation communities:

- **GF1A Tower:** Although shown as Zululand Lowveld in the National Vegetation Map (SANBI 2018), a savanna vegetation type, the vegetation within 100m of the site comprises grassland which is dominated by the unpalatable species *Aristida junciformis* and *Sporobolus africanus*, together with an unidentified, closely cropped *Eragrostis* species. The site is close to longstanding homesteads. Its open nature may be the result of harvesting of trees by homesteads, heavy grazing and browsing impacts, which include cattle, donkeys and goats. There is a kraal site in which animals have been concentrated about 30 metres above the tower centre point. The grass has been grazed to an almost lawn-like consistency and is for the most part not taller than 10 cm (sometimes less). It has evidently lost a large part of its natural species richness, nonetheless, some herbaceous plants which are not ruderals and which are able to survive under conditions of very short stature, persist. Examples are *Chaetacanthus burchellii*, *Gerbera piloselloides*, *Hibiscus pusillus* and *Justicia anagalloides*. *Blepharis natalensis*, also present, is a spiny species avoided by livestock. Common alien invasive or ruderal indigenous herbs include *Alysicarpus rugosus*, *Centella asiatica*, *Sida* sp. and *Solanum panduriforme*. *Lippia javanica*, which is unpalatable and avoided by livestock, is the most important taller plant. Trees and woody plants which remain, such as *Vachellia (Acacia) nilotica* (Scented Thorn), *Dichrostachys cinerea* (Sickle Bush) or a few *Coddia rudis* (Small Bone-apple) are too small, spiny or ill-formed to be useful in this regard. The only protected species encountered was a single specimen of *Aloe marlothii* located 38m south-west of the site as shown in **Figure 20** below.

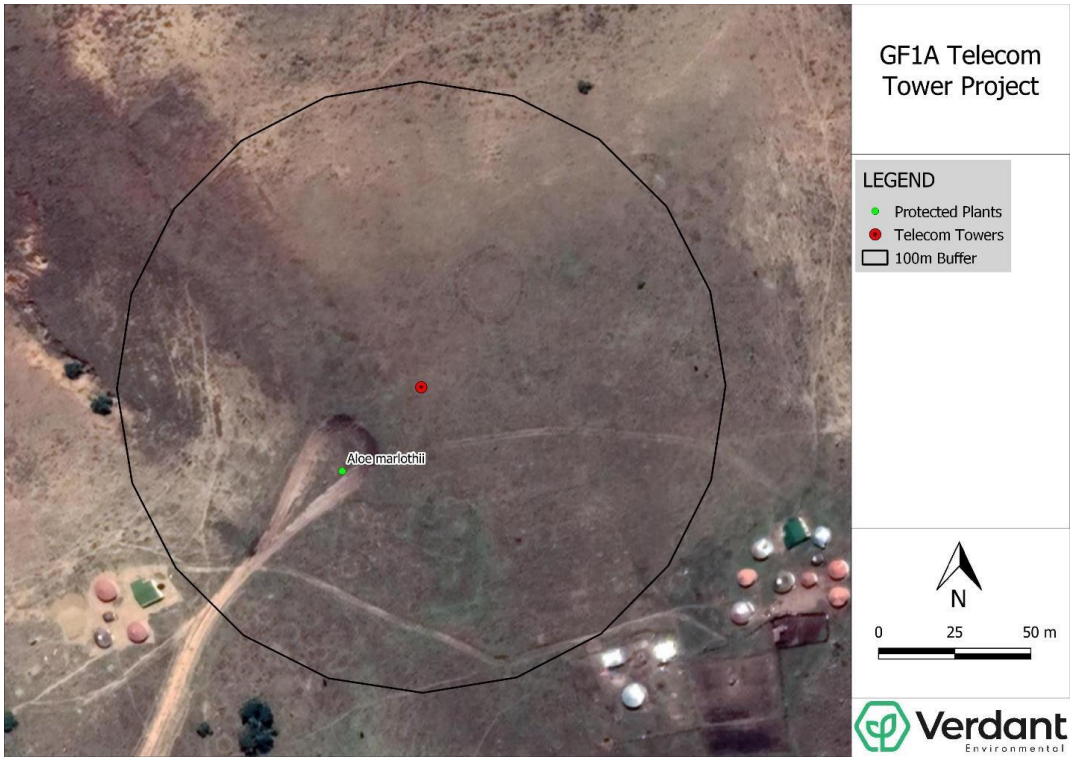

Figure 20: Degraded grassland community within the 100m buffer of the GF1A mast site and one *Aloe marlothii* (protected plant) encountered within the study area.

- **GF3A Tower**: The centre point of the tower is situated on the top a hill slope, which appears to have been previously cultivated or settled. Grassland is secondary and there is little herbaceous diversity except for ruderals and weeds of disturbance, together with *Lippia javanica*. However, below (south of this) and about 60 metres to the north, grassland is in near-natural condition. The grass was very tall and moribund and it was assessed when most of the plant species richness was no longer visible, with mostly taller growing species visible above the grass. This better-quality grassland included an unidentified, tall species of *Senecio*, an unidentified robust *Kniphofia* (not in flower and so not identifiable to species), an unidentified *Pachycarpus* species (ditto) and *Rabdosiella calycina*. Rocky outcrops

30 metres below the centre point and 60 metres north of it, host some more robust species including *Aloe maculata* and *A. marlothii* (protected), *Cussonia spicata* (Common Cabbage Tree) and *Diospyros lycioides* subsp. *guerkei*.

The broad vegetation communities within 100m of the tower site are shown in **Figure 21**.

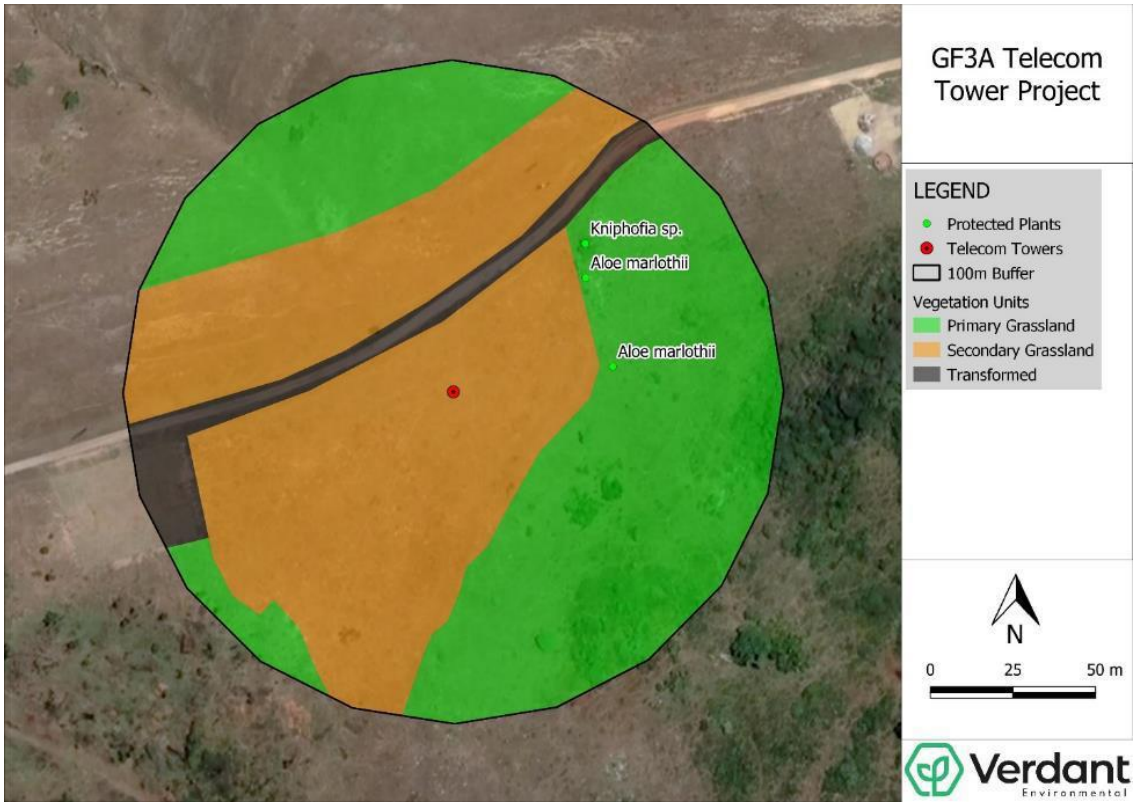

Figure 21: Location and extent of mapped vegetation communities within 100m of the GF3A mast site with protected plants.

- **VGF1 Tower:** This site is shown in National Vegetation Mapping and in the Revised National List of Threatened Ecosystems as Moist Coast Hinterland Grassland, a Vulnerable vegetation type (SANBI 2022). The site is west of a road and comprises grassland that nonetheless appears to be nearly secondary and overwhelmingly comprised of *Aristida junciformis*. Almost no herbaceous diversity appears to occur, likely the legacy of heavy grazing. However, there are a few scattered woody or larger plants in the nearly secondary grassland including two examples of *Aloe marlothii* (Mountain Aloe), protected by the provincial conservation ordinance but not threatened, *Acacia* (*Vachellia*) *nilotica* (Scented Thorn) and *Phoenix reclinata* (Wild Date Palm).

East of the road, which is not the site, grassland has been recently burned off and is still black. Though difficult to assess in just-burnt condition, this grassland appears to retain moderate species diversity, or at least a larger amount than west of the road, especially evidenced by some emerging *Gerbera natalensis* (one of the first species to flower or grow out after fire). Possible explanations for this difference, are that due to rockiness and south-facing aspect, it has a better replacement rate and greater recoverability, or simply that the grassland west of the road has either been cultivated or was much more heavily grazed in the past. As long as the proposed development is situated west of the road, the affected area is considered to be Low Sensitivity. No rare, red listed or threatened species were seen, or based on the degraded habitat, are expected to occur.

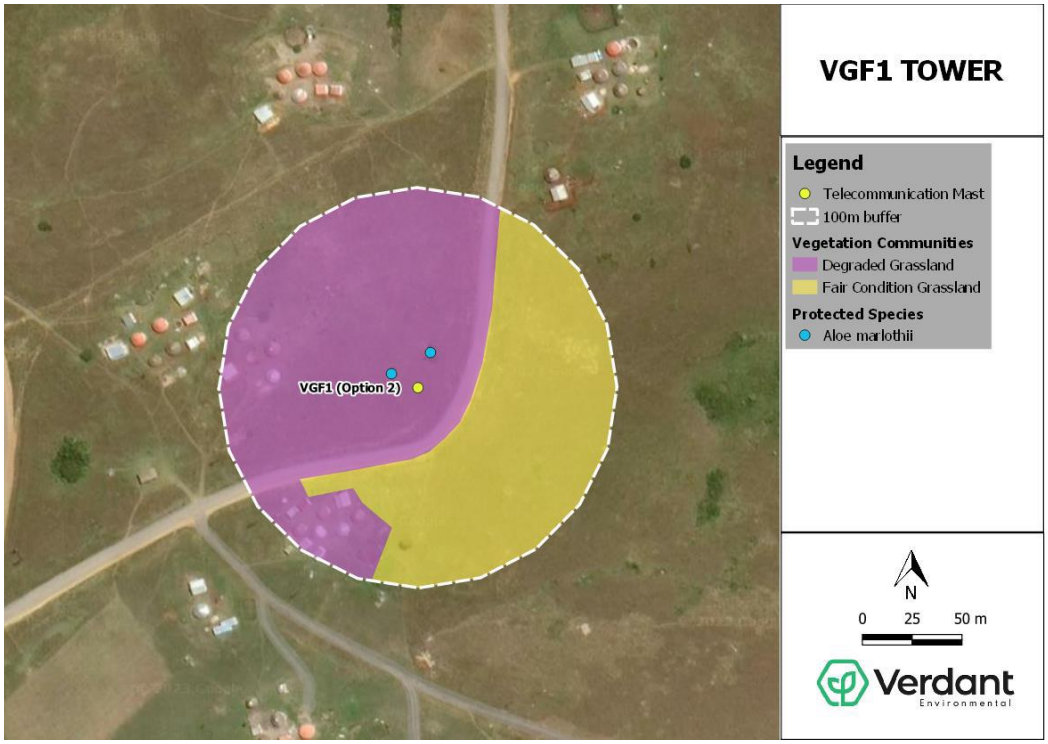

Figure 22: Location and extent of mapped vegetation communities within 100m of the VGF1 site with protected plants indicated.

- **NGF2 Tower:** This site is situated in communal, very well grazed grassland. The grass cover is dominated by unpalatable species, especially *Aristida junciformis*, *Sporobolus africanus* and *S. pyramidalis*. The site is founded on an area of dense invasion by the alien *Plectranthus barbatus*, likely because there was formerly a homestead or kraal here.

Limited herbaceous plant diversity was seen in this grassy growth such as such as *Argyrolobium rotundifolium, Commelina africana*, *Hypoxis hemerocallidea (*one grazed plant seen), *Rhynchosia totta*, together with weedy species such as *Spermacoce natalensis* (indigenous). Weeds mixed in this grassland include *Cirsium vulgare*, *Conyza spp.* (aliens), and *Sida rhombifolia*. *Lippia javanica* also occurs. No rare, red listed or threatened species were seen, or based on the degraded habitat, are expected to occur.

It is noted that the site looks towards Opathe Game Reserve, and that as one proceeds further away and outside the footprint area, down the valley sides, the condition of the vegetation improves. However, as long as the site remains as is, that is east of the road, this is not an issue and the area to be affected is of Low Sensitivity.

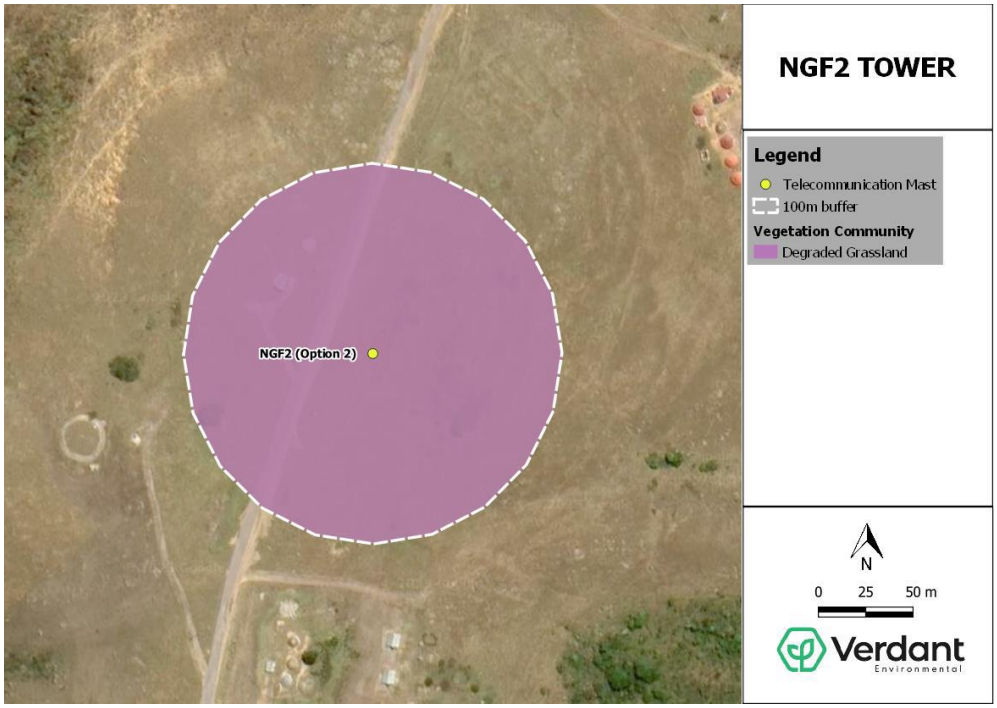

Figure 23: Degraded grassland within 100m of the NGF2 mast site with no protected plant species noted on site.

5.4.4 Rare, Threatened and Protected Species

Red Listed Species: No Red Listed species were encountered on any of the sites

Orange Category Species: No Orange Category species were encountered on any of the sites

Protected Species:

- GF1A Tower: The only protected species encountered was a single specimen of Aloe marlothii located 38m south-west of the site;
- GF3A Tower: A small colony of *Aloe marlothii* are present 30-40m north-east of the tower site, as well as a *Kniphofia* sp. These species are protected and all require a permit from Ezemvelo KZN Wildlife before they can be disturbed, or relocated;
- VGF1 Tower: The only protected plant species encountered was *Aloe marlothii* – 2 individuals located within the 100m buffer of the mast site.
- NGF2 Tower: No protected plant species was encountered within the 100m buffer of the mast site as shown in Figure 23 above.

5.5 Fauna

5.5.1 Site Characteristics and Habitat Description:

- **GF1A:** The study area falls within the Savannah Biome7. The site is dominated by degraded grassland with evidence of overgrazing having occurred (**Figure 20**) On the northern slope of the site a number of rocks are present that may offer refuge for small mammal species. An old, disused kraal is present on the eastern portion of the site. Only one major habitat unit-degraded grassland- is present onsite (**Figure 24**).

Figure 24:: Overgrazed grassland at the GF1A site.

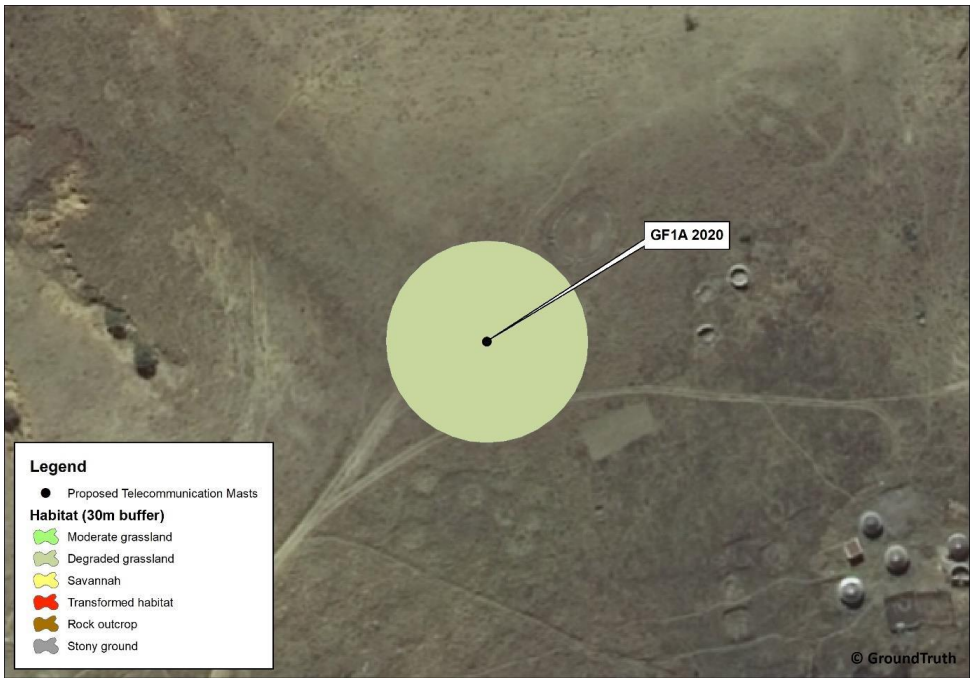

Figure 25: Habitat units identified at the GF1A mast site.

- **GF3A**: The study area falls within the Savannah Biome8. The site is largely flat and slopes gently down in the southern portion of the site. The site is dominated by *Aristida junciformis* and *Sporobolus* species, with the ground densely covered .A number of *Dichrostachys cinerea* individuals are sparsely distributed throughout the site. One major habitat unit, namely moderate grassland, is present at the site.
- **VGF1:** The proposed footprint and part of the surrounding 100m buffer to the north, west and southwest are considered of low value for fauna. These areas are disturbed and/or secondary degraded grassland and patches of settlement. East of the footprint and adjacent road, within the buffer, the habitat improves and appears to be

natural, rocky grassland, which adjoins other areas of relatively unimpacted grassland habitat – these areas are considered of higher (medium) value for fauna.

- **NGF2:** The proposed site and surrounding 100m buffer are considered of low value for fauna. The current proposed development footprint area itself is disturbed and degraded grassland with stands of *Plectranthus barbatus*. Areas around are similarly disturbed and impacted. Beyond the site and 100m buffer, habitat improves somewhat in the west and east, where less disturbed, rocky habitats are present. Only one major habitat unit-degraded grassland-is present onsite.

5.5.2 Mammals

- **GF1A:** A number of these species, particularly rodents that may use rocky habitats for refuge, may occur within the site. However, due to the degraded nature of the vegetation, nearby human settlements, and the presence of livestock, it is unlikely that a wide range of mammal species will utilise the study area. Of the 57 terrestrial mammal species known to occur in the region, nine are Red List species - one is Endangered, three are Near Threatened and five 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 recorded within these protected areas.
- **GF3A Tower:** A number of these species may occur within the site. However, due to the poor grazing value of the vegetation, nearby human settlements, and the presence of livestock, it is unlikely that a wide range of mammal species will utilise the study area. Of the 57 terrestrial mammal species known to occur in the region, nine are Red List species - one is Endangered, three are Near Threatened and five 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
- **VGF1 Tower:** Mammal diversity within the footprint and surrounds is expected to be low, given the impacted nature and low-quality habitats available. None of these will be present within the footprint area.
- **NGF2 Tower:** Mammal diversity within the footprint and surrounds is expected to be low, given the impacted nature and low-quality habitats available. None of these will be present within the footprint area.

5.5.3 Reptiles:

Although no reptiles were observed onsite, the rocky nature of the northern portion of the site ensures that some suitable habitat is available for reptiles. Of the 52 species reported for the region, two are Red List species. The reptile community within the proposed footprint VGF1 & NGF2 Tower is expected to be very poor, and comprised primarily of widespread generalists.

5.5.4 Amphibians

Due to the lack of aquatic habitat onsite, it is unlikely that the site is of major importance for amphibian species.

5.5.5 Invertebrate Diversity

Invertebrates are in general poorly known. Some groups have more information available on them however. While their habitats are incompletely known, most of the more sensitive invertebrate species primarily occur in largely undisturbed habitats. Millipedes and molluscs require moisture and shelter and most are forest or wooded habitat specialists. Butterflies are reliant on specific habitats and the presence of species-specific host and food plants. As such, these groups can be expected to be highly reduced in diversity and numbers of specialised species within and immediately around disturbed areas and more diverse communities of these groups may be present towards areas of natural vegetation and drainage lines.

5.6 **Avifauna**

The planned locations of the four proposed Greenfields tower alternatives (GF3A and GF1A, and NGF2 and VGF1) are on tops of hills southeast of Ulundi (**Figure 26**). The NGF2 and VGF1 paired tower option is presumably under consideration due to EZKZNW's objection to the GF3A and GF1A paired tower option. The co-ordinates for these sites are GF3A: -28.377872, 31.516172 m, GF1A: -28.450900, 31.582653 m, and NGF2: -28.465675, 31.558956 m and VGF1: -28.527263, 31.638297 m. Altitudes are GF3A: 840 m (low-lying surrounding landscape 230 m), GF1A: 720 m (low-lying surrounding landscape 390 m), and NGF2: 760 m (low-lying surrounding landscape 420 m), and VGF1: 580 m (low-lying surrounding landscape 430 m).

Greenfields GF3A was visited on 3 May 2023 and was noted to be situated close to the summit edge of a particularly marked escarpment descending towards the east to the White Imfolozi River below. The slopes of this escarpment are covered in natural vegetation, including forest patches with tall trees suitable for nesting by large birds. This escarpment edge is also characterised by tall cliffs equally suitable for nesting by large birds. Greenfields GF1A was visited on 4 May 2023. This site was situated close to Greenfields NGF2 and was associated with the same ridge of high ground with the White Imfolozi to the northwest (although at greater distance and over less steep terrain than the situation with GF3A).

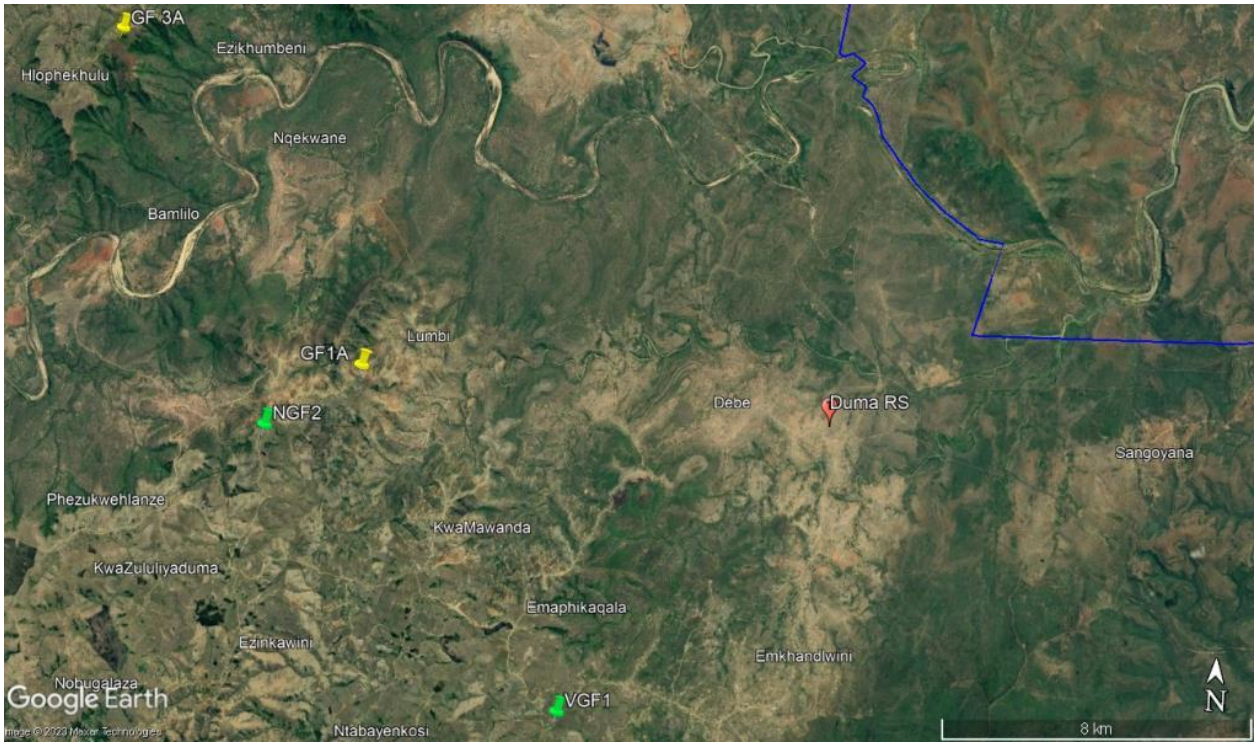

Figure 26. The proposed locations of the four Greenfields tower options (GF3A and GF1A, and NGF2 and VGF1).[2]

Southern African Bird Atlas Project 2 information

[2] The blue line delineates the boundary of the Hluhluwe-Imfolozi Game Reserve/Important Bird and Biodiversity Area (IBA). The location of the proposed Duma tower (Duma RS) is also depicted.

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 23**) 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.

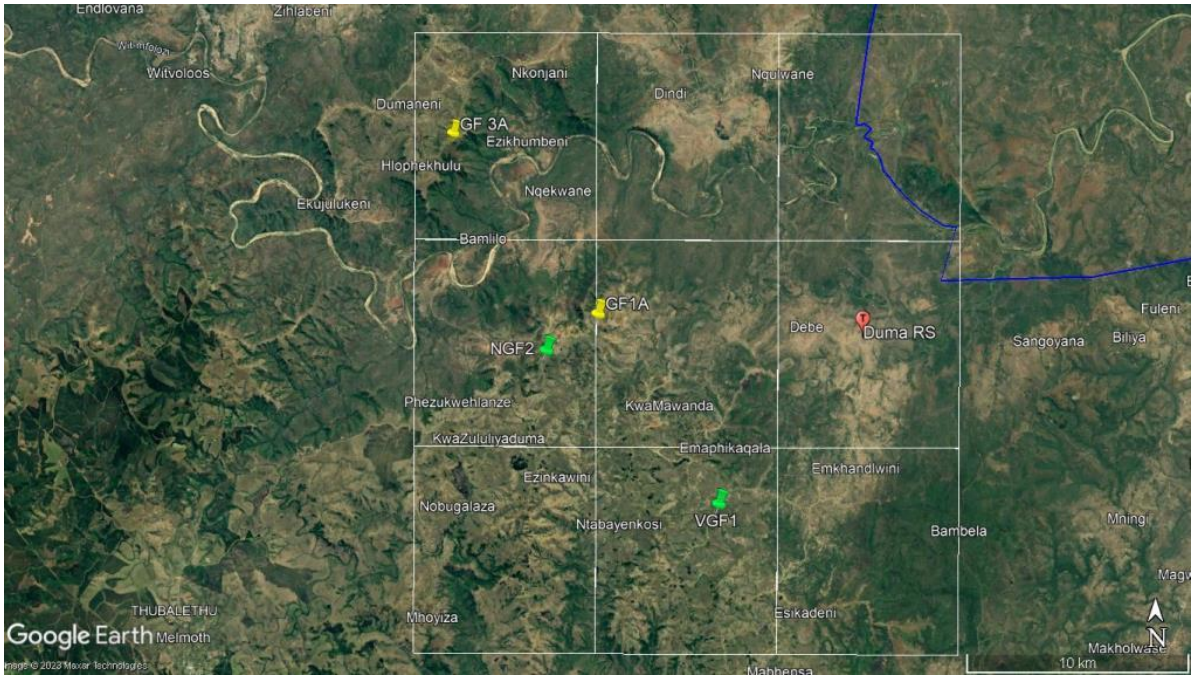

Figure 27[3]. The nine pentads, delineated by the white lines, from the Southern African Bird Atlas Project (SABAP2)

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,

[3] 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).

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 10**).

Table 10[4]: 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

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

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 10**), 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 28-30 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 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.

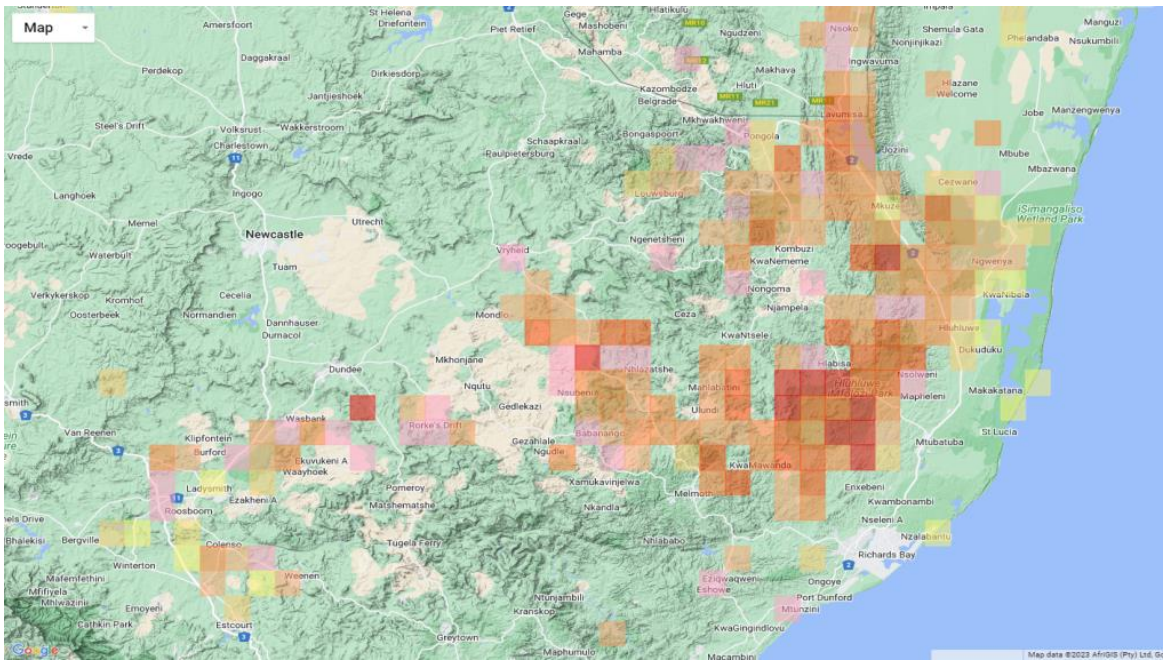

Figure 28. SABAP2 distribution map for the White-backed Vulture showing the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located.

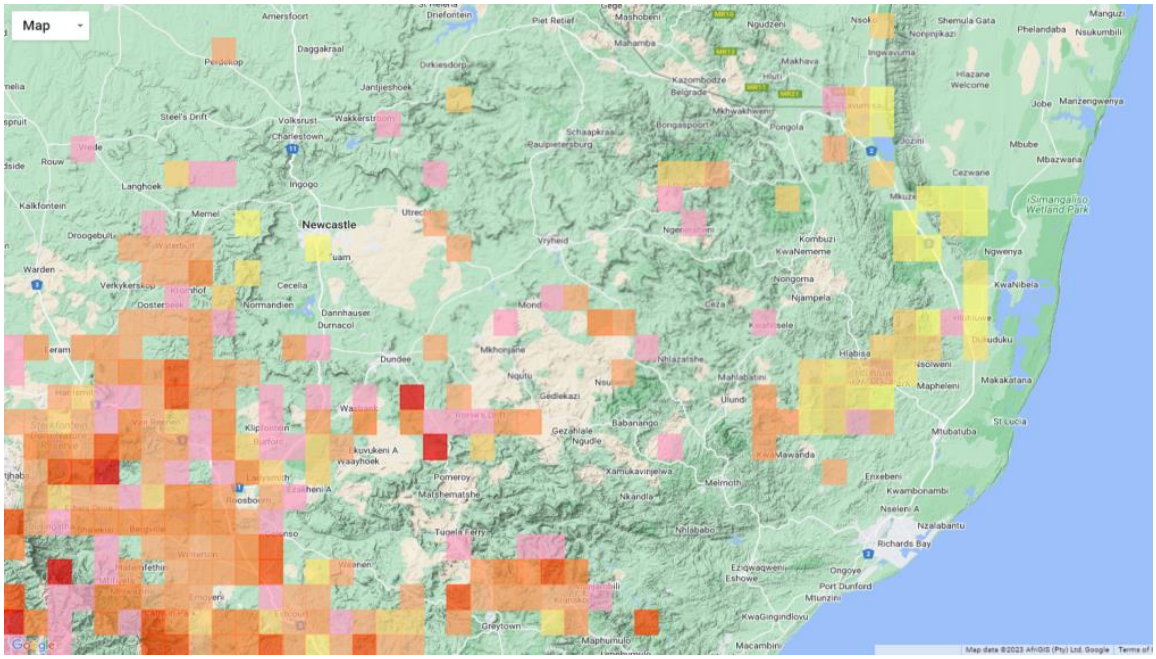

Figure 29: SABAP2 distribution map for the Cape Vulture showing the presence of this species in the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located.

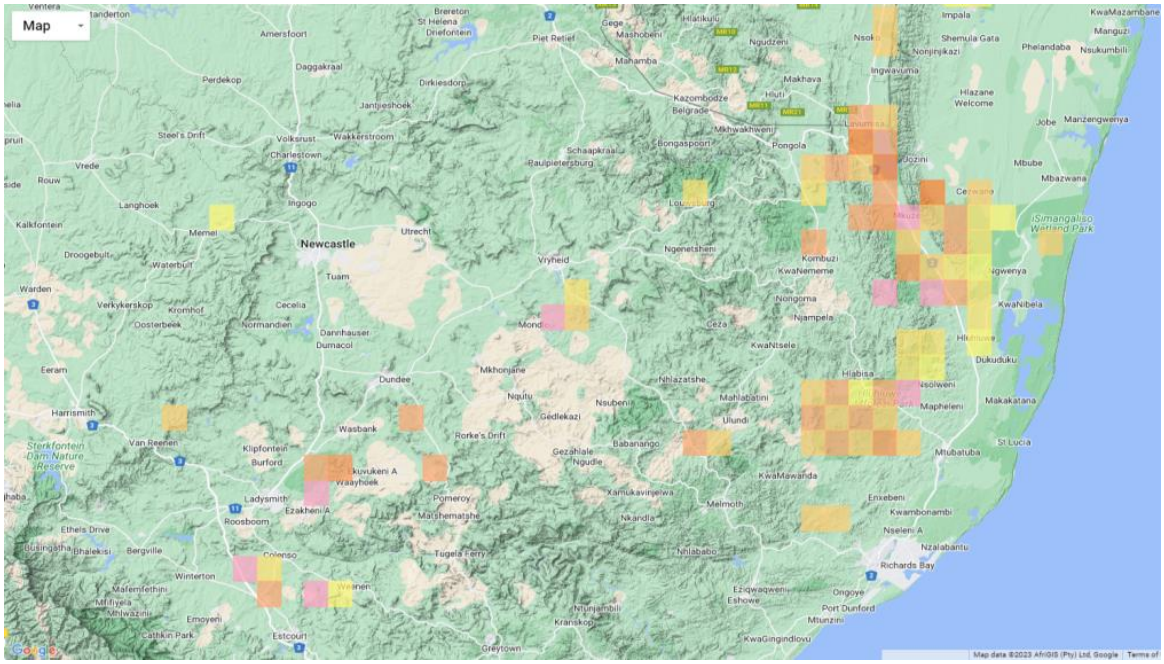

Figure 30. SABAP2 distribution map for the Lappet-faced Vulture showing some evidence for this species also utilizing the 'vulture movement corridor' extending to the west of Hluhluwe-Imfolozi Park and in which the five proposed Duma RS and Greensfields tower options are located.

5.7 **Cultural Heritage Aspects of the area**

5.7.1 Heritage Aspect

- **Stone Age period:** Over time the amount of exchange items seems to decline, as is evidenced form the material recovered from the various shelters that Mazel excavated. This is seen as symptomatic of a society beginning to experience a greater level of stability, where they need not to invest so heavily in servicing extended social relations. However, a parallel increase and intensifying in ritual activity can also be seen during this time.
- **Iron Age period:** The Hluhluwe area was originally a royal hunting ground for the Zulu kingdom, but was established as a park in 1895. The Umfolozi and Hluhluwe reserves were established primarily to protect the white rhinoceros, then on the endangered species list.
- **Historic period:** After the annexation of Natalia by the British in 1843, many of these early white settlers left the area and moved onto the central plateau area to settle in what was to become the Orange Free State Republic and the South African Republic (ZAR). Rev. Aldrin Grout started the Inkanyeza Mission in April 1841. This first white settlement in the area was abandoned during tribal hostilities fifteen months later. White settlers returned in 1851 when the Norwegian mission was established and by 1894 the lower Umfolozi Magistry was established in Empangeni which was becoming an active trading centre.
- **Site specific review**: The area in which the development of the RS towers 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 fields. 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.

5.7.2 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 remain 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**.

5.8 Visual Characteristics of the area

5.8.1 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 the grassed mountain tops and densely wooded valley fissures down to the main rivers and streams. A peaceful and tranquil sense of place prevails as residents go about their day to day activities.

5.8.2 Viewshed Analysis

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 locations. 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.

The conclusion is that the study area generally provides a medium to high degree of screening. This is motivated by the fragmented patterns illustrated by the viewshed analyses. Alternative 2's patterns are noticeably more fragmented than alternative 1's. This may be a result of the lesser height of alternative 2' towers, or the topography that is more elevated in that area.

The landcover, for example the natural vegetation, do provide an additional screening capacity in specific locations. The higher mountain areas and plateaus are mostly grassland and offer no additional screening capacity. The denser vegetation cover in the valleys and drainage lines will provide additional screening in certain localised areas.

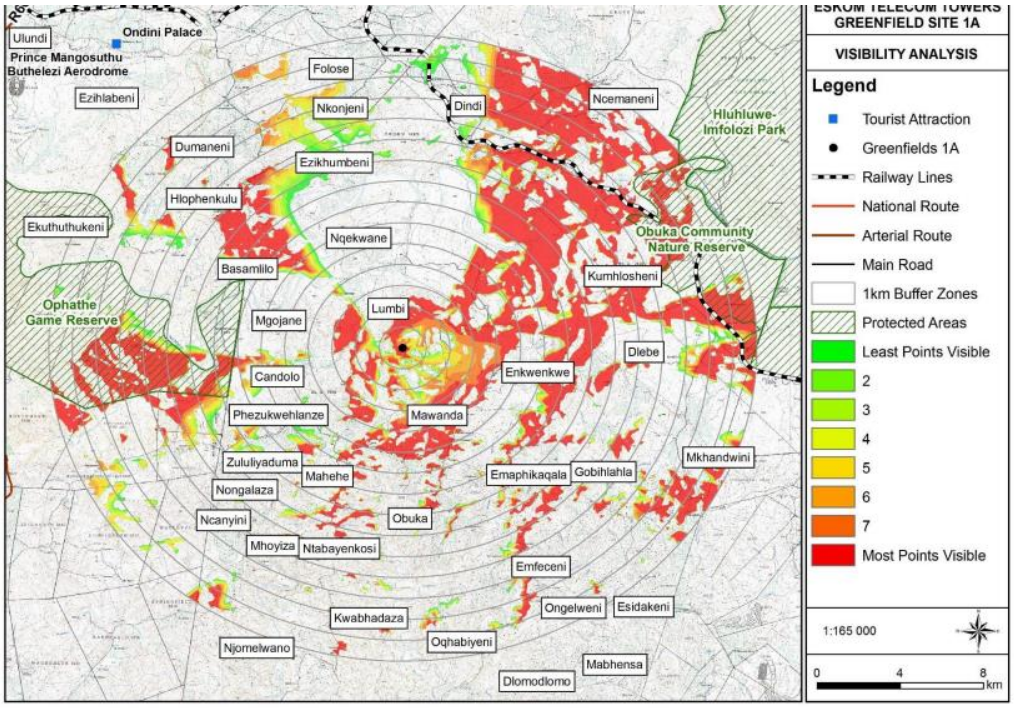

Figure 31: Cumulative viewshed map GF1A

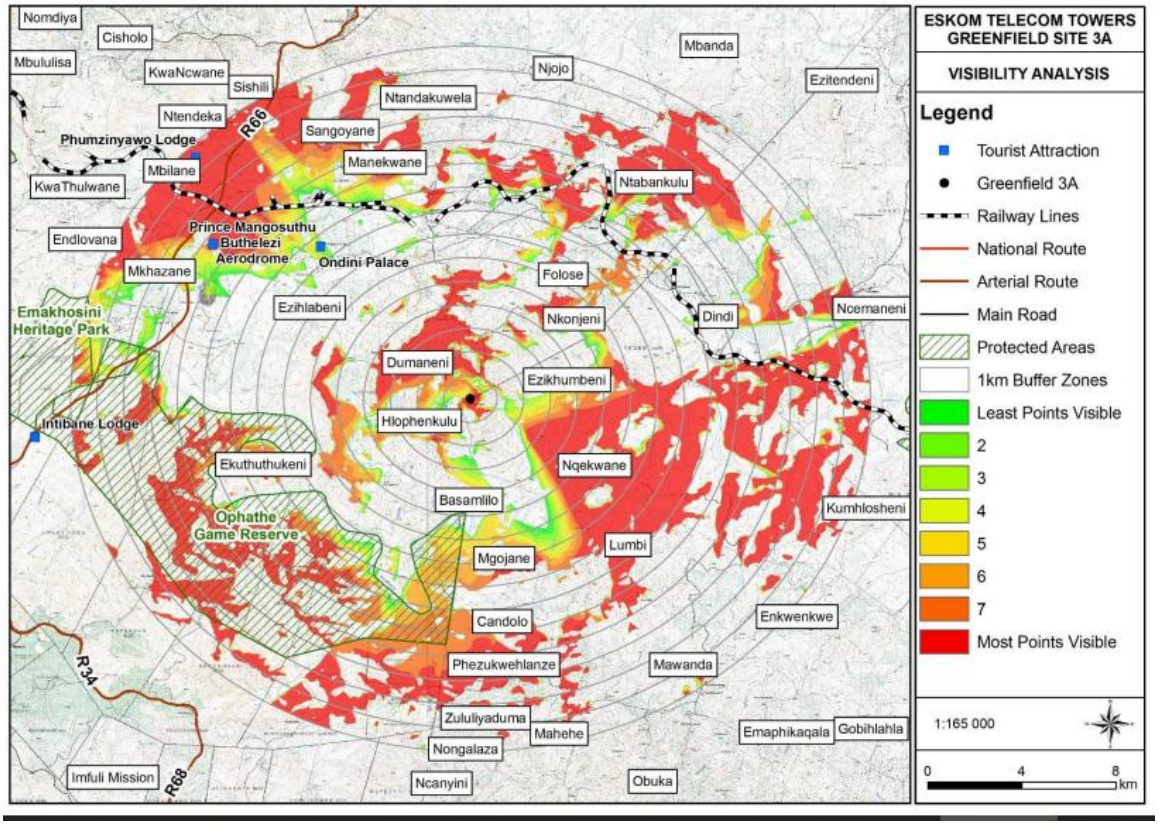

Figure 32: Cumulative viewshed map GF3A

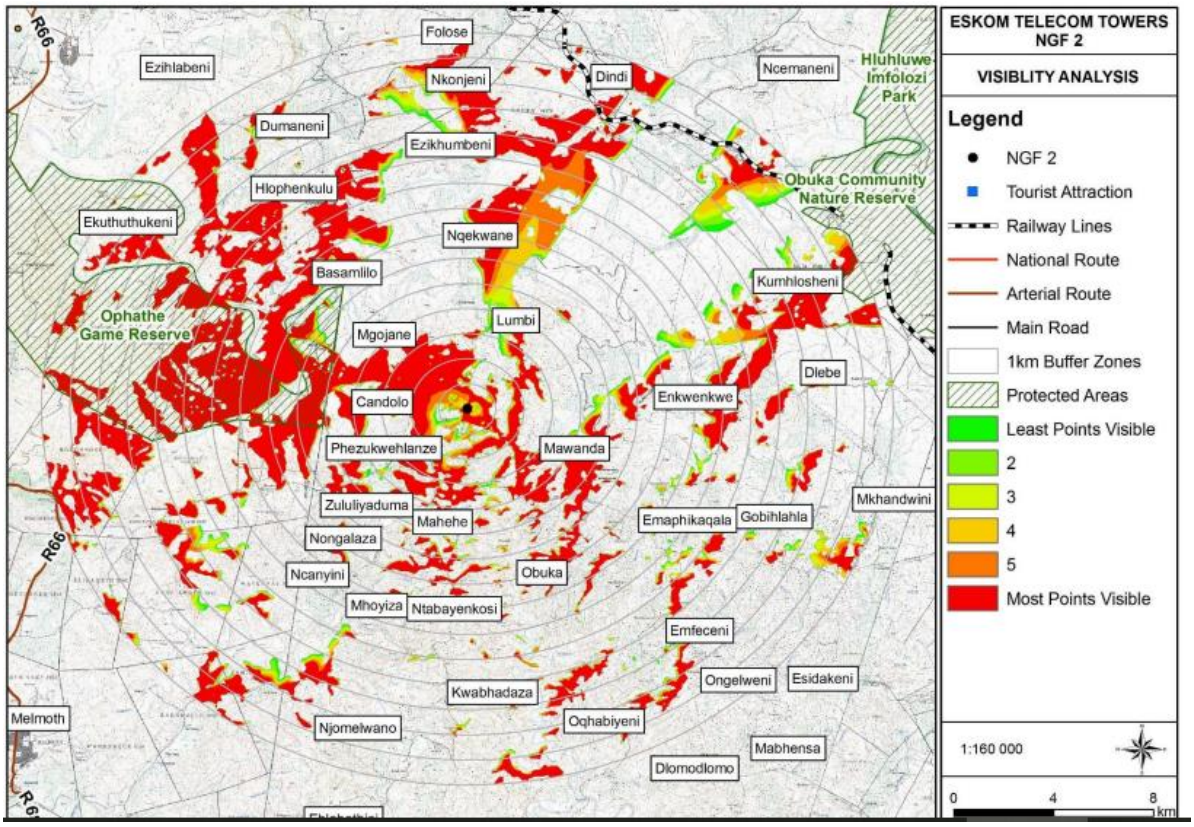

Figure 33: Cumulative viewshed map NGF2

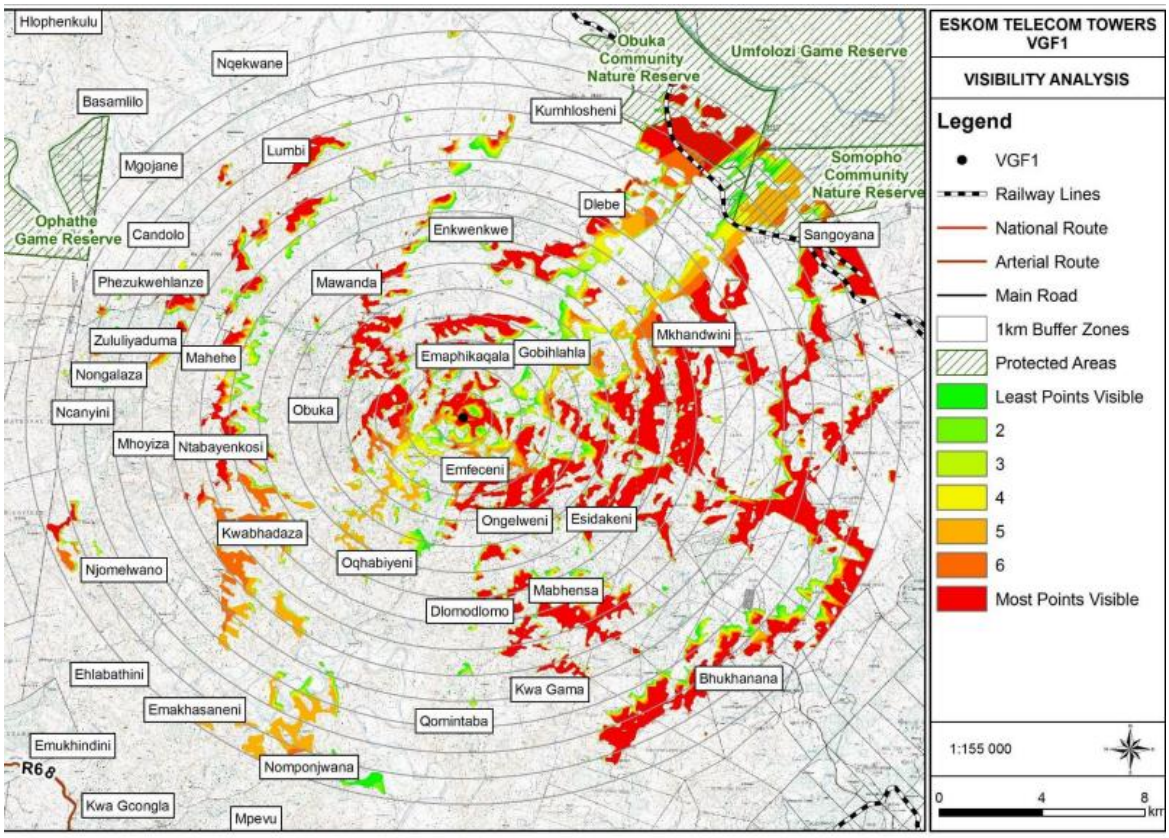

Figure 34: Cumulative viewshed map VGF1

5.8.3 Study Area Photographic Record

As shown in **Figure 35** of -

- Photo (1) – This photo location is near the GF1A and NGF 2 tower sites and represents the surroundings of the study area. The typical building style is small square or round houses, sometimes clustered together or spread out over the hills. The elevated location of the tower site enables expansive panoramic views across the hilly landscape.
- Photo (2) – This photo is taken near the GF1A tower site overlooking the valley towards the White iMfolozi River which can be seen in the middle ground as a faint grey line. This location is approximately 15 km from the southern boundary of the HiP which can be seen as the last horizon line in the photograph. It has been enlarged with a digital zoom factor of 1.8x and indicates the diminishing visibility range over distance.
- Photo (3) - Photo 3 is a panoramic photo from the NGF 2 tower site towards the west. The distant mountains are within the Ophathe Game Reserve and the villages of Gandolo can be seen in the valley nearest to the tower site. The White iMfolozi River passes behind the first hill and meanders through the mountains.
- Photo (4) – This photo represents the landscape character near the VGF 1 tower site. It shows the similarities of the landscape character and settlement patterns across all the different study areas. Widespread villages and grassy hills are a common sight.
- Photo (5) – This photo represents the point of view at the VGF 1 tower site looking towards the HiP which is approximately 15 km northeast from this location. It illustrates the expansive panoramic views from the elevated vantage points and the diminishing level of visual detection over the fast distances.
- Photo (6) - This photograph is taken near the GF3A tower site from a dirt road leading towards the proposed tower site at approximately 3.2km from the site. It illustrates the natural-rural landscape with the sparsely distributed villages along the dirt road. This is also a clear indication of the differences in the summer and winter landscape character.

Photo (1)

Photo (2)

Photo (3)

Photo (4)

Photo (5)

Photo (6)

Figure 35: Study Area Photographic Records

5.9 **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 36 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.

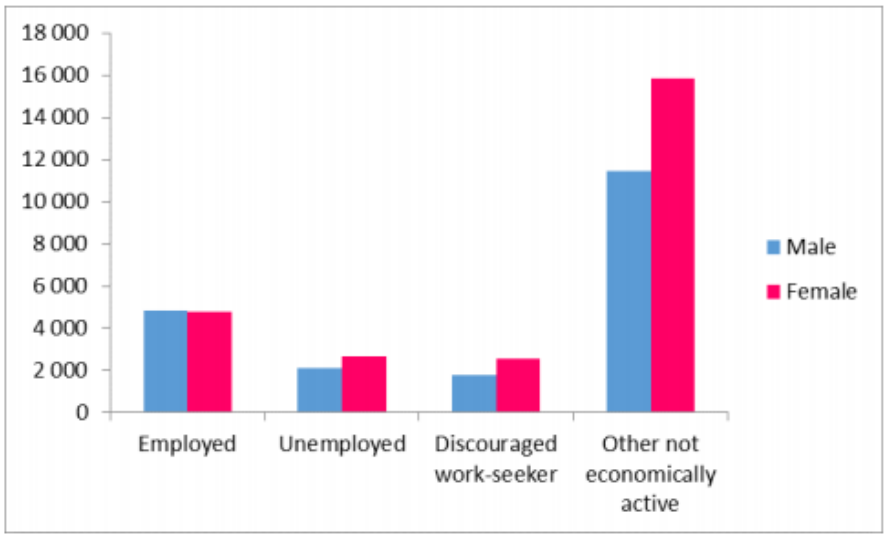

Figure 36: Employment by Gender Source: *Mthonjaneni IDP 2021-2022.*

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

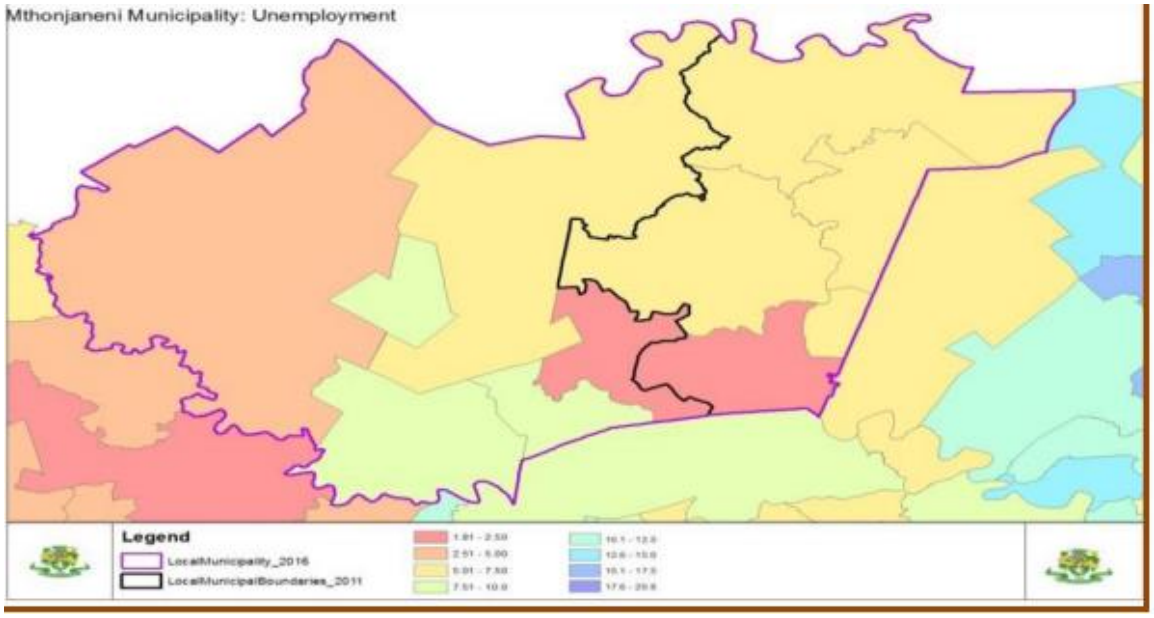

Figure 37:: Showing Unemployment within the Municipality.

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[5] 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).

6.1.1 Results of the Wetlands Assessment:

- **Option 1** (GF1A and GF3A): All the potential watercourses occurring within 500m of the GF1A tower site were mapped as shown in **Figure 38,** below. A total of five 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 nearest watercourse to the tower site is located 100m to the west and comprises a steep, ephemeral headwater mountain stream. The site drains in the direction of this stream.

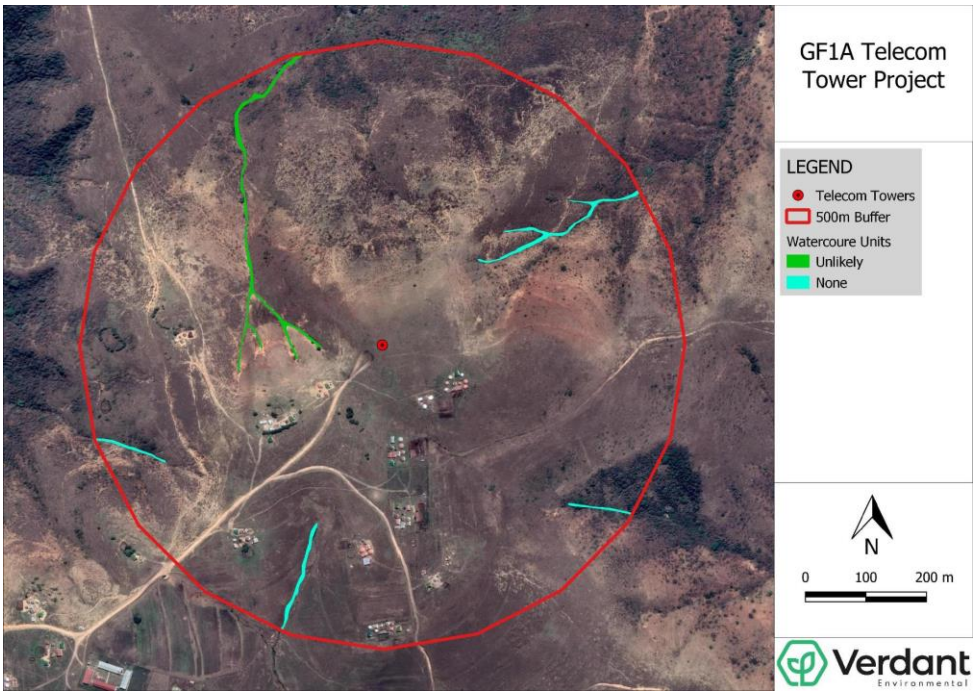

Figure 38: Watercourses within 500m of the GF1A tower site with an indication of the likelihood of impact.

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

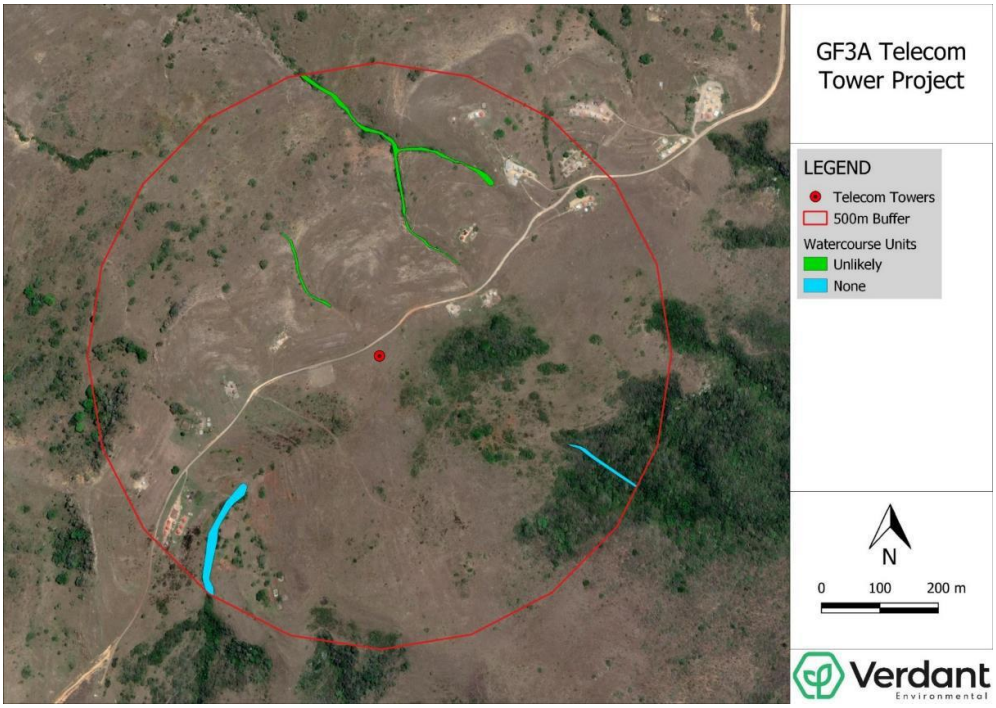

Figure 39: Watercourses within 500m of the GF3A tower site with an indication of the likelihood of impact

- **Option 2** (NGF2 and VGF1): All the potential watercourses occurring within 500m of the NGF2 tower site were mapped as shown in **Figure 40 and 41 below**. A total of twenty-five watercourse units were identified and mapped within 500m of the site. Only two of the watercourses within the same catchment and closest to the tower site were verified in the field, namely: The nearest watercourse to the tower site is located 83m to the south-east and is a seep wetland. The site drains in the direction of this seep. An ephemeral mountain head water stream is located 130m east of the site. The site drains in this direction.

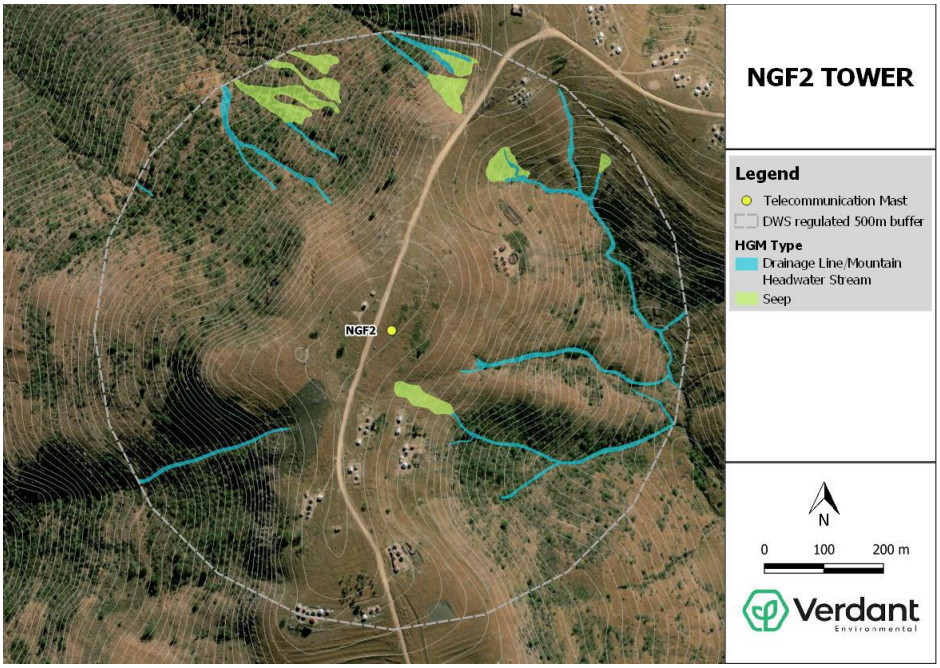

Figure 40: Watercourses within 500m of the NGF2 tower site classified according to HGM type.

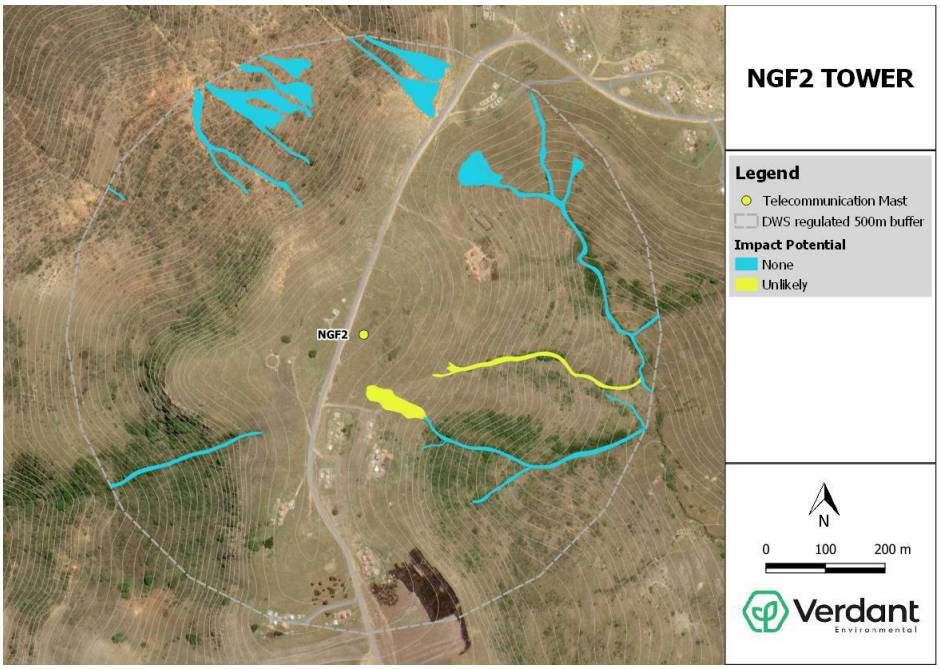

Figure 41: Watercourses within 500m of the NGF2 tower site with an indication of the likelihood of impact.

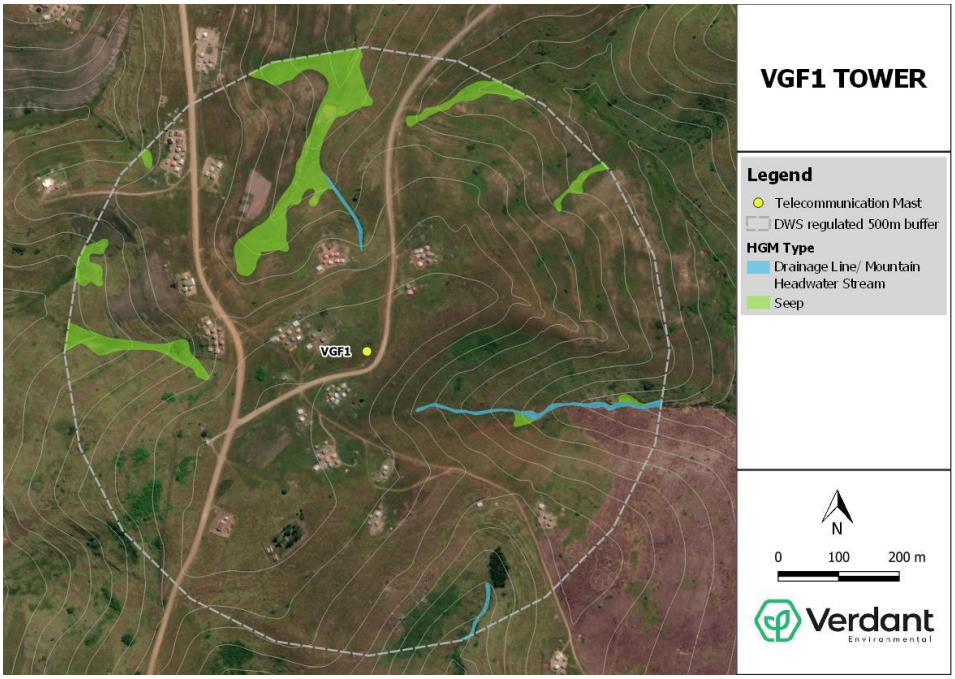

Figure 42: Watercourses within 500m of the VGF1 tower site classified according to HGM type.

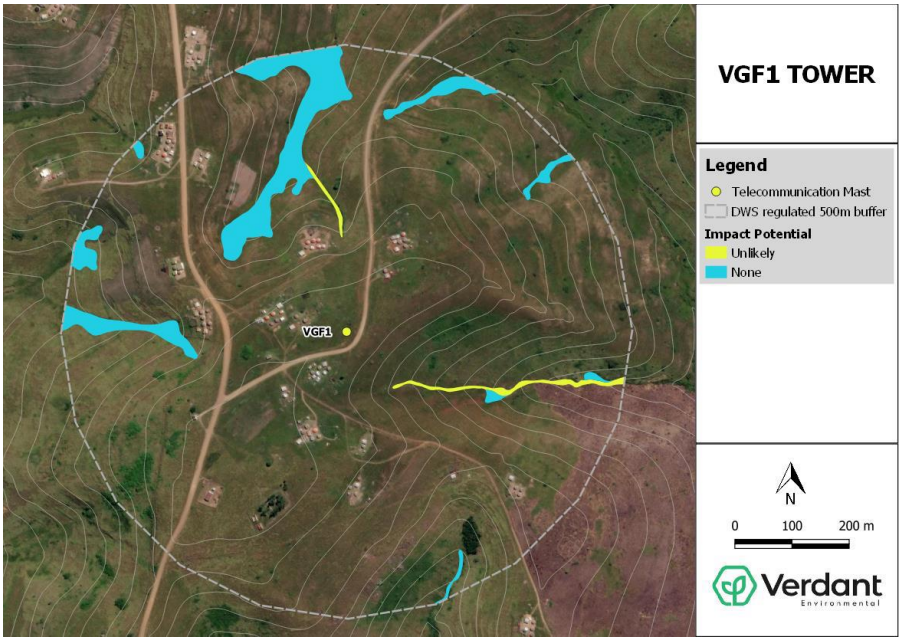

Figure 43: Watercourses within 500m of the VGF1 tower site with an indication of the likelihood of impact.

6.1.2 Description of Impacts:

- GF1A: Only the ephemeral headwater mountain stream located 100m to the west of the site was verified in the field, labelled as Unit R01. A single headwater mountain stream was identified and confirmed onsite.
- GF3A: Onsite observations of the two streams north of the tower site were undertaken. These streams were confirmed as ephemeral headwater mountain streams
- NGF2: Only 2 watercourse units located 83m to the south-east (W01) and 130m to the east (R01) were verified in the field
- VGF1: Only 2 mountain headwater streams located 118m to the east (R01) and 150m to the north-west (R02) were verified in the field. R01 was only photographed at a distance although soil sampling was done upslope to confirm

whether there was any hydric soil present within 100m of the mast site, vegetation notes were not taken as most of the site had been recently burnt. R02 was also photographed at the head of the unit and vegetation notes taken.

6.2 Vegetation

6.2.1 Results of the Vegetation Study, Ecological Importance and Sensitivity

- **GF1A Tower**: Due to the very heavy grazing and browsing and loss of much of the natural plant richness on this site, the ecological importance and sensitivity of the vegetation is low (**Figure 44**).
- **GF3A Tower**: The tower site vegetation comprises degraded grassland of low ecological importance and sensitivity. However, beyond this it is more primary and evidently still quite species diverse. It contains some less commonly encountered species, together with a robust *Senecio* species. which though allied to S. *discoidregeanus* is not this species. Its identity could not be satisfactorily resolved by time of writing of this report. The primary grassland is considered of moderate ecological importance and sensitivity. The EIS map for the vegetation within 100m of the tower site is shown in **Figure 45.**

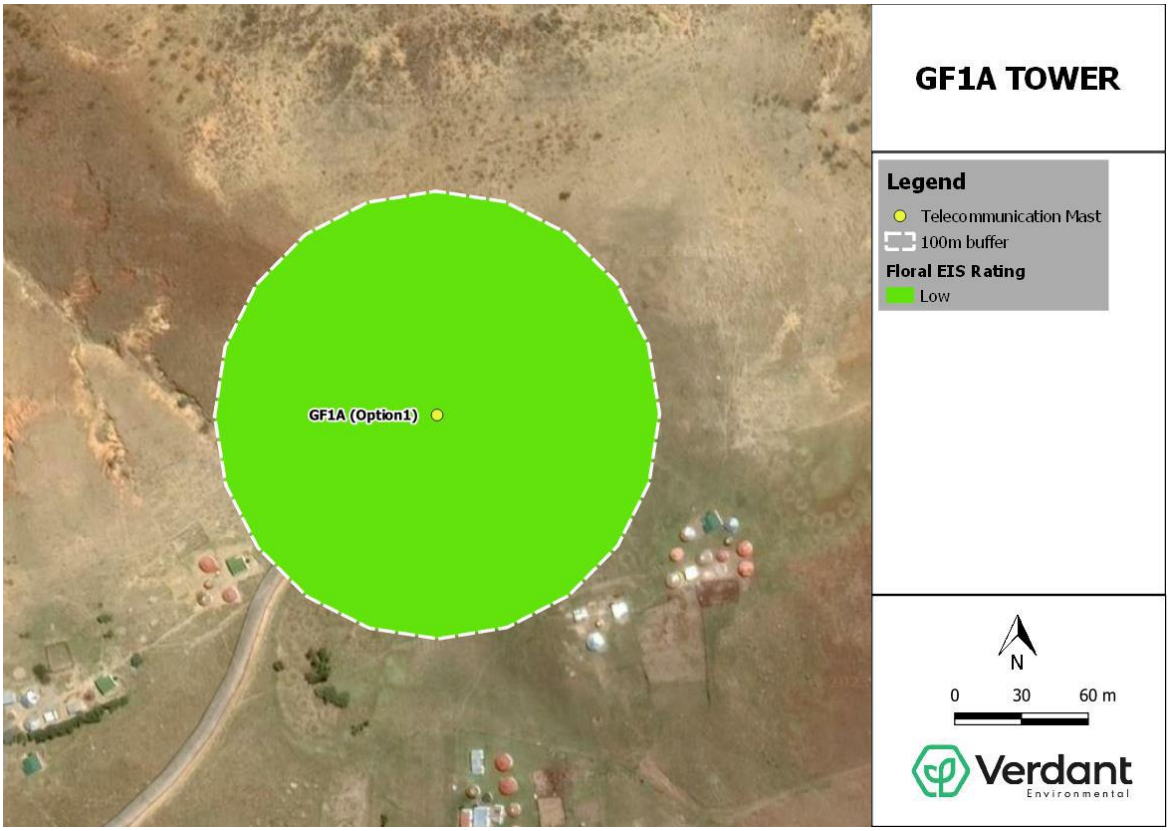

Figure 44: Vegetation EIS map for the GF1A Tower site.

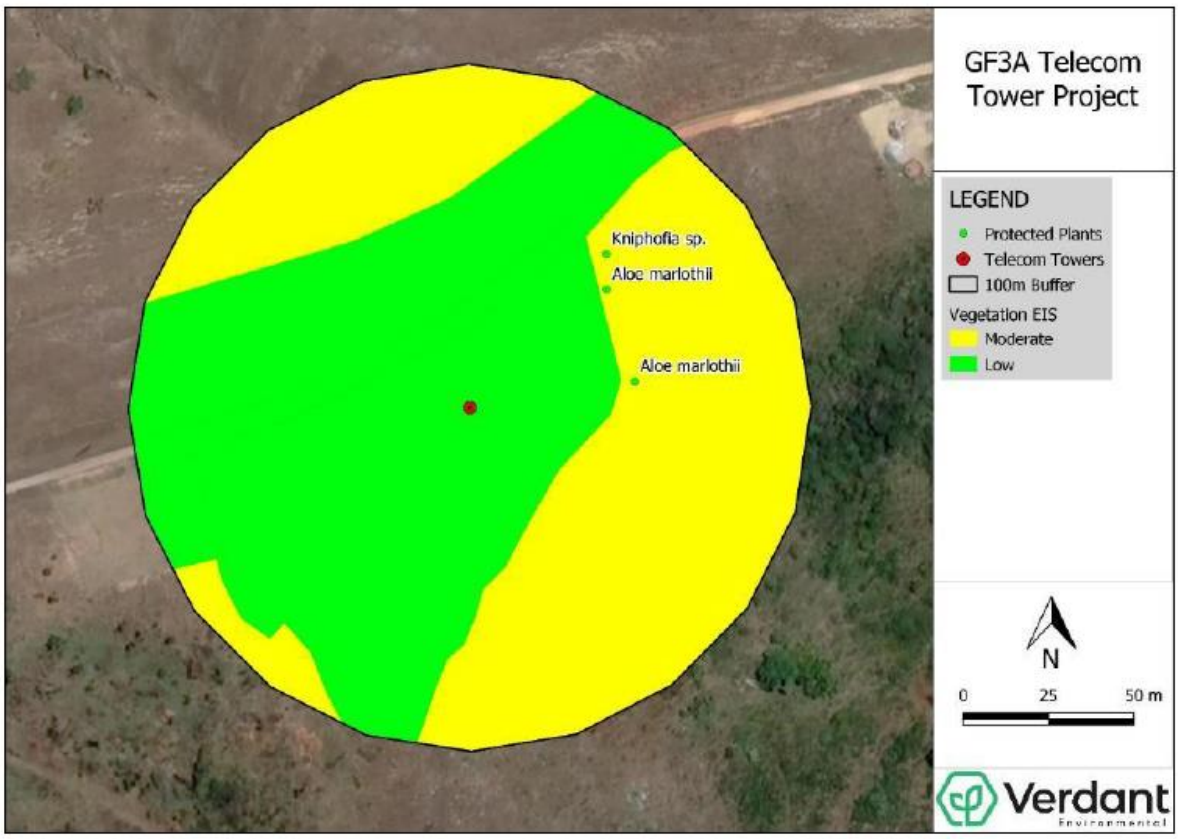

Figure 45: Vegetation EIS map for the GF3A Tower site.

- **VGF1 Tower**: The site is west of a road and comprises grassland that appears to be nearly secondary and overwhelmingly comprised of *Aristida junciformis*. Almost no herbaceous diversity appears to occur, likely the legacy of heavy grazing and there the area west of the road closest to the mast site is considered to be of Low sensitivity. East of the road, where grassland has been recently burned off, there appears to be some species diversity remaining and therefore the sensitivity is considered to be Moderate.
- **NGF2 Tower:** Due to the very heavy grazing and browsing and loss of much of the natural plant richness on this site, the ecological importance and sensitivity of the vegetation is low**.**

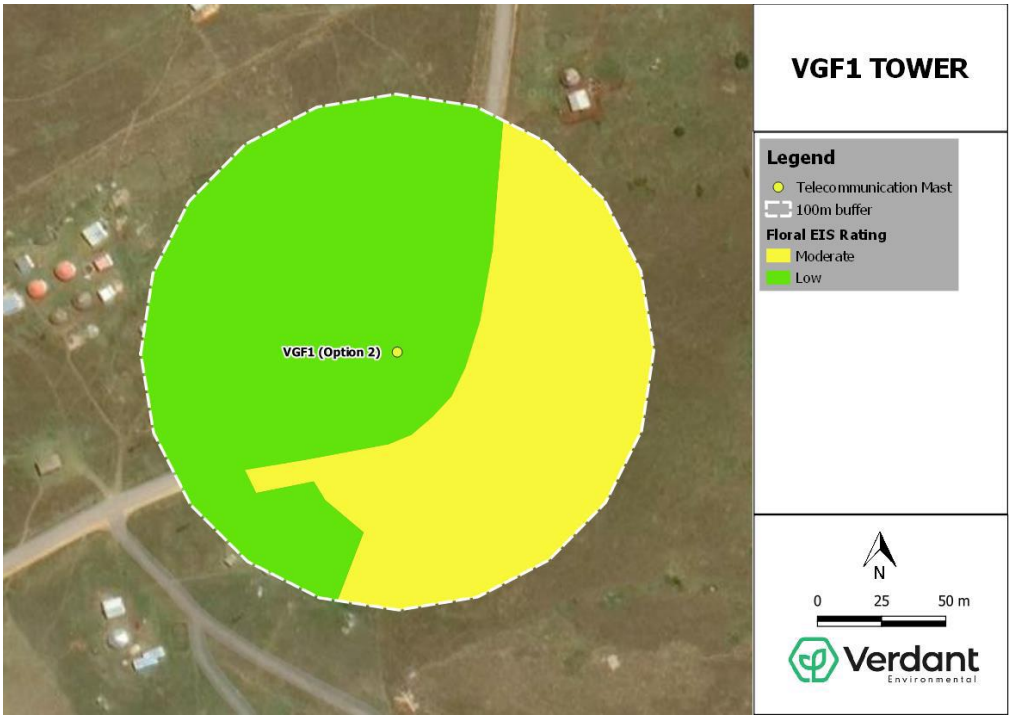

Figure 46: Vegetation EIS map for the VGF1 Tower site.

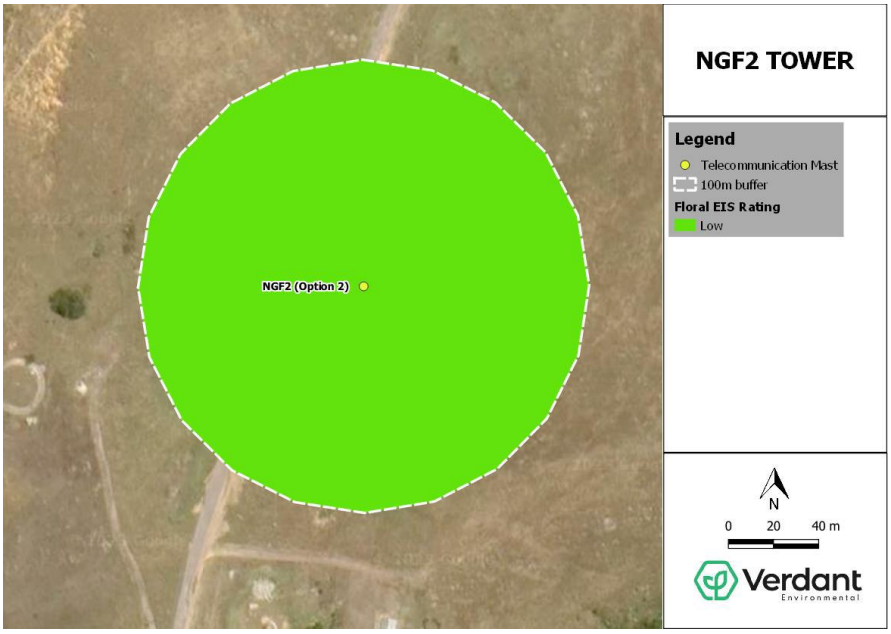

Figure 47: Vegetation EIS map for the NGF2 Tower site.

6.2.2 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 (C1-1, O1-1 & D1-1)** – 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.

- I**ndirect ecosystem disturbance impacts (C1-2, O1-2 & D1-2)** – 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.

Each of the above-listed impacts were assessed in terms of impacts to:
- Impacts to terrestrial communities and habitats.
- Impacts to terrestrial biota / species (flora and fauna).
- Impacts to local and regional landscape ecological processes.

The significance of the impacts was assessed in terms of the following end points or ultimate consequences:
- Impacts in terms of meeting ecosystem and habitat conservation targets.
- Impacts in terms of meeting species conservation targets.
- Impacts on local and regional landscape ecological processes.

The activities requiring assessment for this study and the associated potential impacts are summarised in **Table 11** below.

Table 11: Summary of impacts assessed for each of the project activities.

Activities	Impact Group	Impact Description
C1. Construction of powerlines	C1-1: • Direct ecosystem destruction and modification impacts	• Planned direct impacts to grassland for tower establishment. • Planned direct impacts to grassland for access road establishment. • Accidental direct impacts to grassland by heavy machinery during construction i.e. poorly planned access roads. • Rare, protected and/or threatened flora and fauna mortality / fatalities.
	C1-2: • Indirect ecosystem disturbance impacts	• Erosion and/or sedimentation of grassland due to soil and vegetation clearing and landcover disturbance during construction. • Pollution of grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.
O1: Operation of powerlines	O1-1: Direct ecosystem destruction and modification impacts	• Accidental direct impacts to grassland by heavy machinery during repair and maintenance i.e. poorly planned access roads. • Avi-fauna fatalities i.e. collisions (assessed in separate avifauna report).
	O1-2: Indirect ecosystem disturbance impacts	• Erosion and/or sedimentation of grassland due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Pollution of grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance.
D1: Decommissioning of powerlines	D1-1: Direct ecosystem destruction and modification impacts	• Accidental direct impacts to grassland by heavy machinery during decommissioning i.e. poorly planned access roads.
	D1-2: Indirect ecosystem disturbance impacts	• Erosion and/or sedimentation of grassland due to soil and vegetation clearing and landcover disturbance during decommissioning. • Pollution of grassland due to the mishandling of hazardous

6.3 **Fauna**

6.3.1 Results of the Faunal Study, Ecological Importance and Sensitivity

- **GF1A Tower:** The site can be classified as Medium sensitivity for terrestrial faunal species (**Figure 48**).
- **GF3A Tower**: Based on the habitat and terrestrial fauna present onsite, the sensitivity of the site can be classified as medium (**Figure 49**).

Figure 48: Habitat sensitivity in terms of terrestrial fauna at the GF1A site.

Figure 49: Habitat sensitivity in terms of terrestrial fauna at the GF3A site.

- **VGF1** Tower: The footprint area and adjacent areas are of low value for fauna. The proposed footprint area has been transformed or fairly heavily degraded, and will be of much reduced value to fauna in its current state. Areas east of the dirt road are in better condition, and are considered medium value for fauna, as they will support more natural communities, and are classified as CBA Optimal area and a threatened ecosystem. Given this, it is considered that the proposed development footprint is suitable for appropriate development. Areas east of the dirt road should not be developed upon or disturbed in any way. Alien plant infestations should be monitored and managed during construction and operation.

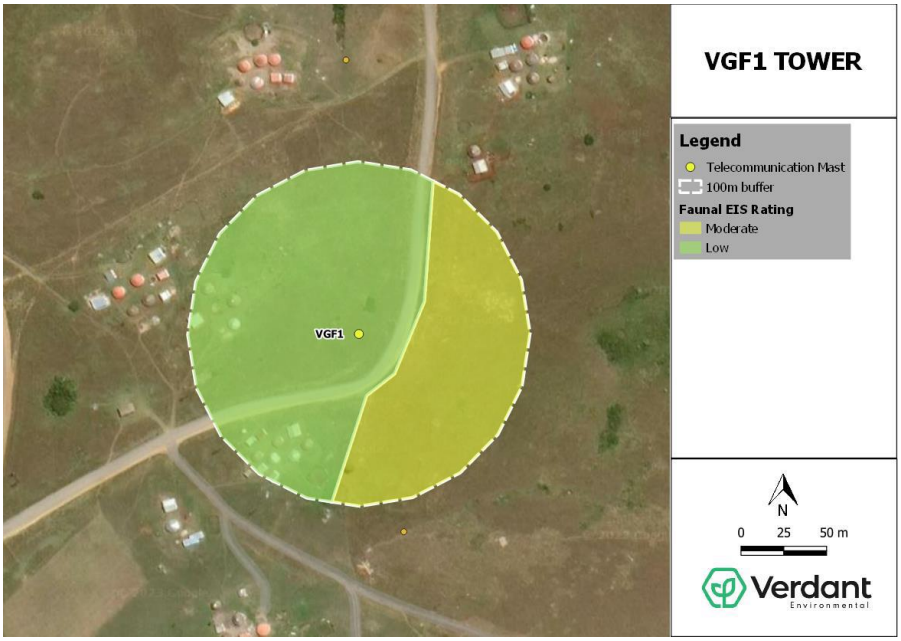

Figure 50: Habitat sensitivity for terrestrial fauna at the VGF1 site.

- **NGF2 Tower:** The footprint area and adjacent areas are of low value for fauna. The proposed footprint area has been transformed or fairly heavily degraded, and will be of much reduced value to fauna in its current state. Some areas further away from the study area, outside of the proposed footprint are in moderate condition, and are considered of moderate faunal value. Given this, it is considered that the proposed development footprint is suitable for appropriate development. Areas outside the footprint should not be developed upon. Alien plant infestations should be monitored and managed during construction and operation. The site can be classified as Low sensitivity for terrestrial faunal species **(Figure 51).**

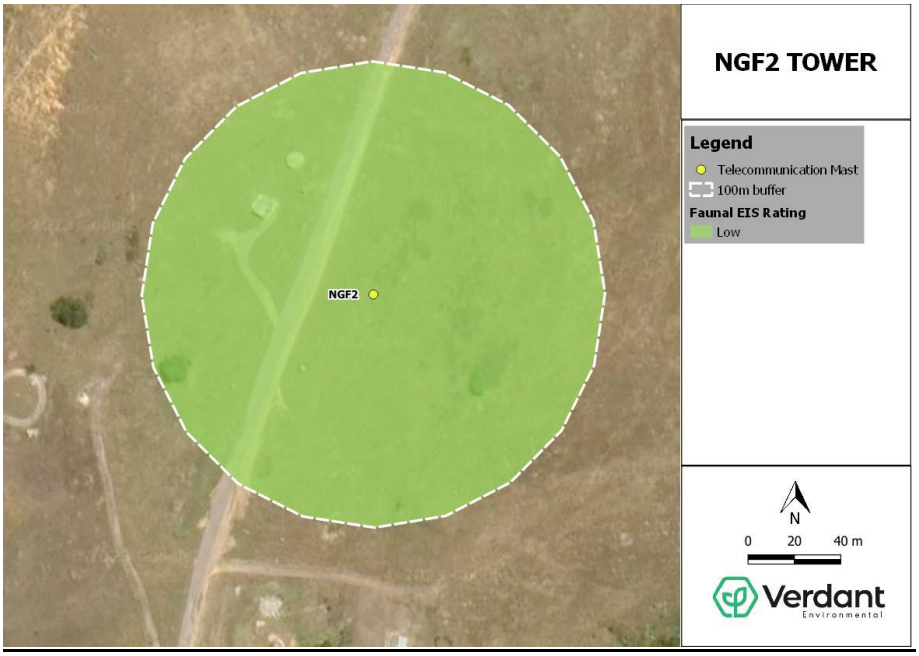

Figure 51: Habitat sensitivity for terrestrial fauna at the NGF2 site.

6.3.2 Description of Faunal Impacts:

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

- **Direct ecosystem destruction and modification impacts (C1-1, O1-1 & D1-1)** – 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.
- I**ndirect ecosystem disturbance impacts (C1-2, O1-2 & D1-2)** – 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.

Each of the above-listed impacts were assessed in terms of impacts to:

- Impacts to terrestrial communities and habitats.
- Impacts to terrestrial biota / species (flora and fauna).
- Impacts to local and regional landscape ecological processes.

The significance of the impacts was assessed in terms of the following end points or ultimate consequences:

- Impacts in terms of meeting ecosystem and habitat conservation targets.
- Impacts in terms of meeting species conservation targets.
- Impacts on local and regional landscape ecological processes.

6.4 **Avifauna**

6.4.1 Results of the Faunal Study

The proposed Greenfields GF3A and GF1A, and Greenfields NGF2 and VGF1 paired tower options are of significant avifaunal concern relevant to collisions. They are situated in high-elevation area subject to poor visibility due to low cloud and mist. These proposed tower options are situated at localities without any existing towers. This area supports threatened bird species including vultures vulnerable to collisions with such elevated structures and their associated infrastructure. The area covered by these options is also close to the Hluhulwe-Imfolozi Park, a major stronghold of many of the threatened bird species of concern here, especially White-backed Vulture. Ezemvelo KZN Wildlife has raised significant concerns relevant to tower construction in this area, especially as relates to the towers being located in a 'vulture movement corridor' (**Figure 52**). They have specifically recommended that such towers be re-located outside this corridor, a suggestion which has not been taken up by Eskom, although the 'new' proposed Greenfields VGF1 tower option is located marginally closer to the outer edge of this corridor relative to the other relevant tower options.
The proposed tower heights are 80 m for Greenfields GF3A and GF1A, and a lower and more preferable 65 m for NGF2 and 70 m for VGF1. The proposed structures should ideally be tubular monopoles rather than the planned lattice structures but this is not an issue of over-riding concern.

The proposed Greenfields GF3A tower option is considered fatally flawed from an avifaunal perspective as it is situated on the edge of a very marked escarpment directly over the White Imfolozi River with forest patches and tall cliffs suitable for breeding by several of the vulnerable threatened bird species in close proximity. Mitigation by ensuring no lateral support cables are used for this tower is not considered sufficient mitigation in these highly sensitive circumstances. This

renders the proposed Greenfields NGF2 and VGF1 tower option as the only alternative option. The proposed Greenfields NGF2 and VGF1 tower option though should only be pursued if it is considered mandatory that any towers constructed at these localities 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.

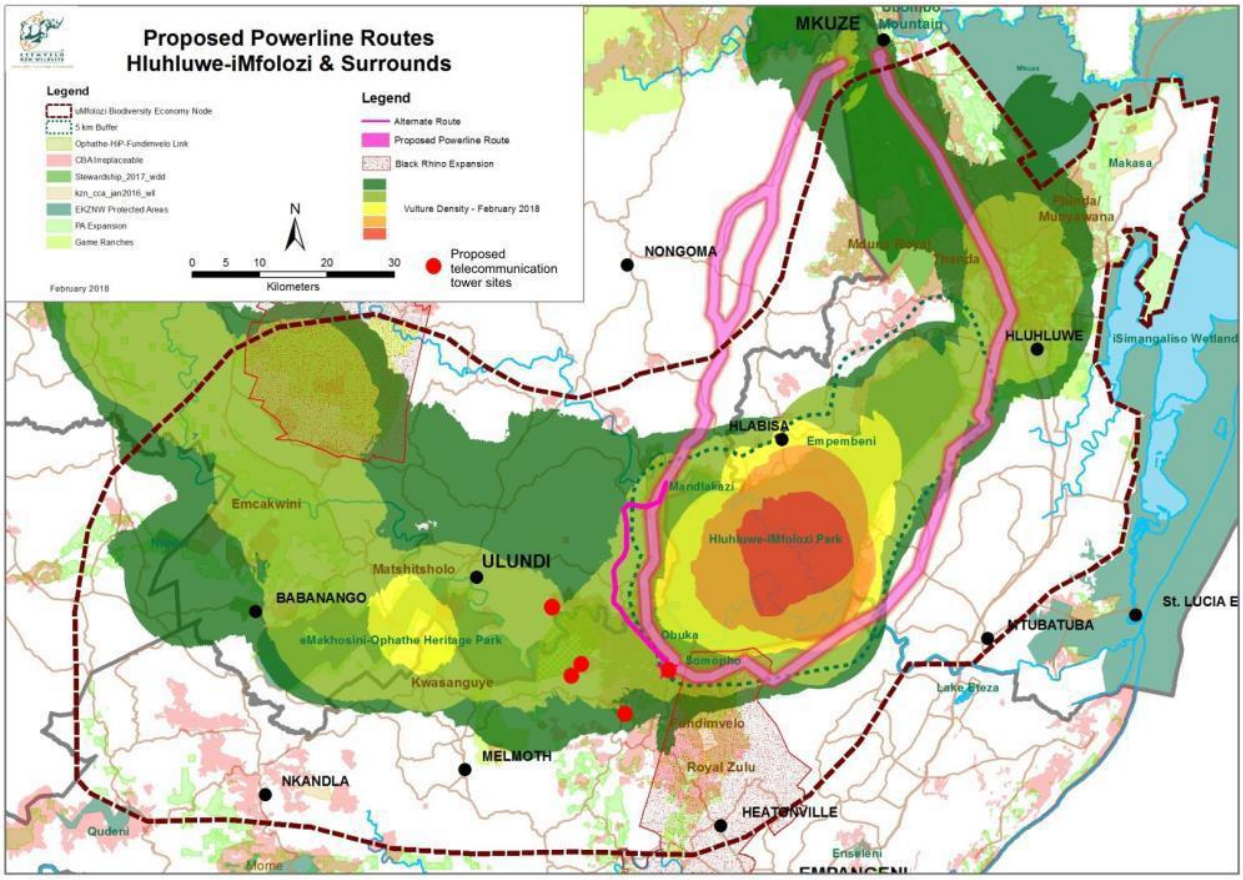

Figure 52: Map of 'vulture density' during February 2018 as provided by EKZNW, with the locations of the five Duma RS/Greenfields proposed telecommunications tower site

6.4.2 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 (P.C. Benson unpublished; Figure 4).

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 Crow's 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).

6.5 **Cultural Heritage Aspects of the area**

Results of the Heritage Study

- **Burial site**. Coordinates: S 28,46561; E 31,55905: An informal burial site with an unknown number of graves marked only with stone cairns. Due to the dense vegetation cover encountered on the site, it was impossible to determine the size and extent of the burial site. In addition, a number of middens, i.e., archaeological sites also occur in the vicinity. These are probably remains of houses and can therefore be linked to the graves (**Figure 53**).

Figure 53: The tower site in relation to the burial site (Tower NGF 2)

- **Shembe Church site**. Coordinates: S 28,45059; E 31,58293: Sites of religious significance such as the one identified adjacent to the project area near GF 1A derive from one of the African Initiated Churches, or independent churches, i.e., a Christian church independently started in Africa, rather than by outsiders such as missionaries. In this part of the country, it probably is from the Nazareth Baptist Church, colloquially referred to the Shembe Church, founded by Isaiah Shembe in 1910 (**Figure 54**).

Figure 54:The tower site in relation to the church site

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 12: 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 13: 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.

6.6 Visual Impact

6.6.1 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 villages surrounding the four tower sites are widespread and sparsely populated. It has been established that observers inside the ZMVE (i.e., within 2km from the site) will experience the greatest exposure. These residents will experience full and partial views of the proposed towers. A very low viewer incidence is expected due to the low population density.

Outside the ZMVE and up to 5km, the visual exposure will diminish greatly as the distance between observers and the towers increase. Although detectability of the towers in these zones, are still possible, topographic screening becomes increasingly more relevant due to the topographic variation in the landscape. Residents in these zones will experience a reduced visual exposure. Viewer incidence is expected to be higher due to a larger area being affected, but is still considered relatively low.

Beyond the distance of 7-9 km, atmospheric haze and the minute size of a tower in the visual field, renders detectability negligible and visual exposure insignificant. 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 limited to road users on the gravel roads leading to the various villages. Intermitted views of the proposed towers are expected as motorists travel through the study areas. Viewer incidence is expected very low due to the sparse road network and the relatively limited number of vehicles travelling on these dirt roads as a result of the low population density in the study area.

Tourists are not considered an observer group that will enter the ZMVE or even pass through the 5 km distance zone due to the remoteness of the sites. No tourist attractions currently exist near the tower sites. It is however 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 study area does not offer tourism destinations at the moment near any of the four tower sites.
The Ophathe Game Reserve and HiP are located outside of the 5km distance zone for all four tower sites. The closest tower site is NGF 2 which is located 5km from the eastern boundary of the Ophathe Game Reserve and more than 12 km from the existing offices and staff accommodation. Figure 20 (4) represents a view from the tower site towards the eastern boundary of the Ophathe Game Reserve. It clearly illustrates the diminishing visibility over such distances and therefore negligible visual exposure is expected from this reserve.

6.6.2 Sensitivity of the Landscape Character:

The landscape character is considered homogenous across all four sites and will be discussed in terms of its overall character . The study area is considered to have a medium VAC. The topography will generally provide a medium to high degree of screening, resulting in a fractured visibility pattern as illustrated in Figure 17 - Figure 19. The degree of visibility is expected to vary between partial and full views of the towers. Typically, high lying or flattish areas will experience full views, and areas on the away facing slopes or low lying valleys will have partial to no views.

The study area, encompassing all four sites, are homogenous in their character and are evaluated according to similar attributes. The landscape character sensitivity is considered high and is attributed to the generally undeveloped nature of the study area and its natural vegetation cover that is largely intact, although partially transformed in and around the settlements. These features, in addition to the high degree of topographical variation, panoramic views across the mountains and deep valleys, all contribute to a high scenic quality. High value landscape features are associated with the White-iMfolozi River to the north of the GF1A & NGF2 sites and south of the GF3A site, with its meandering canyon supported by dramatic mountains as a backdrop.

6.7 **Agricultural Potential Impact**

6.7.1 Results of the Agriculture Study

- **Greenfield Tower Site 1A & 3A**: The area has low potential for agriculture based on the classification indicated in (**Figure 55)**. 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 Greenfield Tower 3A construction. The area required (900 m2) for constructing the tower will not have significant impact on the area available for agriculture.

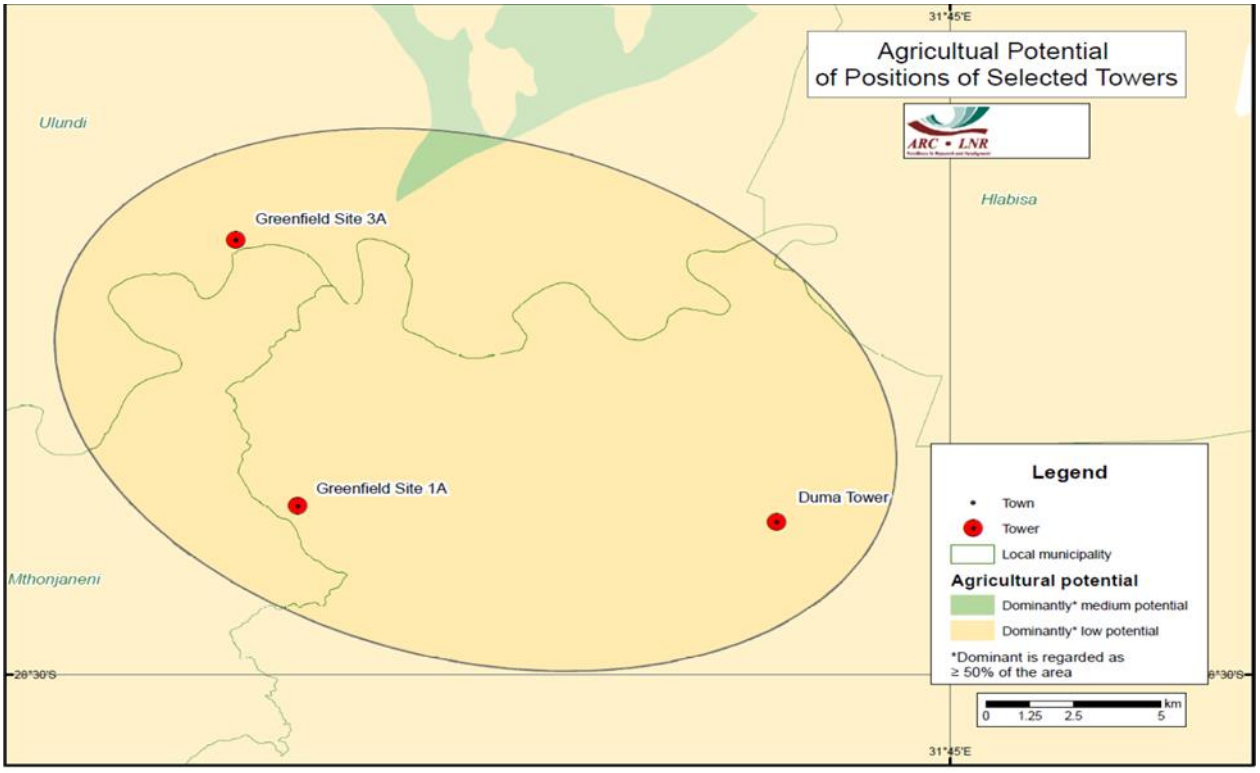

Figure 55: Agricultural Potential Map of Tower Site 3A & 1A

- **Greenfield Tower Site NGF 2**: The area has very low potential for agriculture based on the classification. 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 very low agricultural productivity level, the land can be utilized for the alternative Greenfield Tower NGF 2 construction. The area required (900 m2) for constructing the tower will not have significant impact on the area available for agriculture.

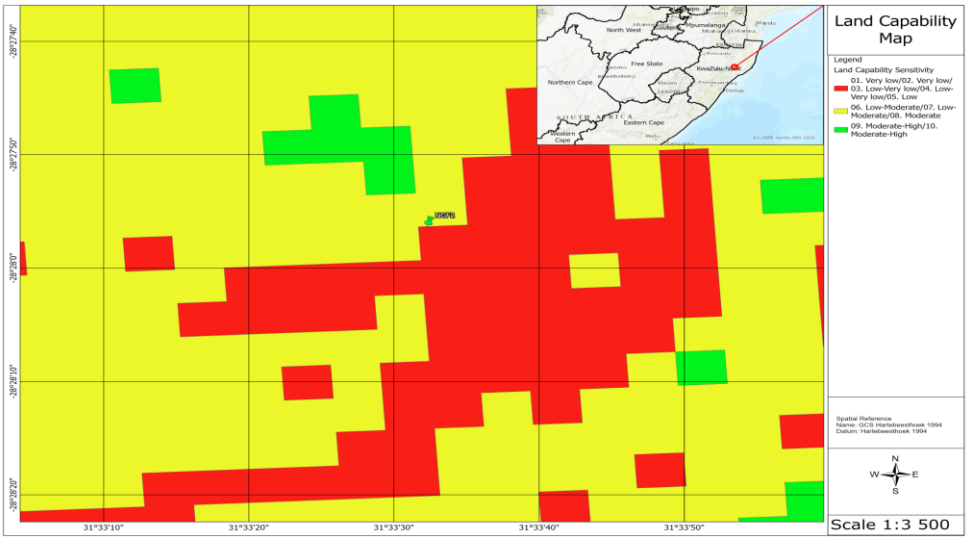

Figure 56: Land Capability map of the NGF 2 tower study area

- **Greenfield Tower Site VGF 1:** The area has very low to medium potential for agriculture based on the classification. The agricultural value of the area is low- medium due to lack of commercial agricultural productivity in the area. Therefore, based on the fact that the site area has very low agricultural productivity level, the land can be utilized for the alternative Greenfield Tower VGF 1 construction. The area required (900 m2) for constructing the tower will not have significant impact on the area available for agriculture.

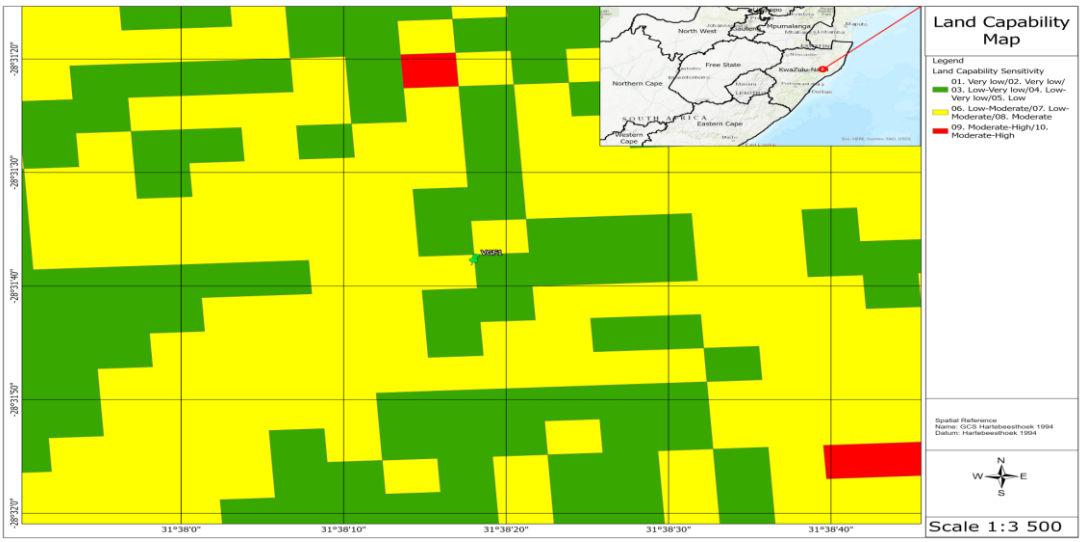

Figure 57: Land Capability map of the VGF 1 tower study area

6.7.2 Description of Impacts:

Based on the fact that all the sites assessed for the Tower area has low agricultural productivity level, the land can be utilized for the proposed Greenfield Tower 1A construction. The area required (900 m2) for constructing the tower will not have significant impact on the area available for agriculture.

6.8 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:

6.9 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 mitigation 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

- **Site Alternatives:** Two Feasible pairs of Greenfield Alternative Sites were investigated are as follows:
  Alternative 1: Greenfield 1A and Greenfield 3A
  OR
  Alternative 2: NGF2 and VGF1.

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

NB: The above-mentioned alternatives considered for this project do not differ considerably in their significance as far as Environmental Impacts are concerned, therefore potential impacts discussed in this section of the report are relevant for all alternatives considered for this project 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 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.*

7.3.1 Aquatic and Wetland Impact Assessment.

NATURE OF POTENTIAL IMPACT/RISK	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**
OPERATIONAL PHASE			
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	**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. • 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	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
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***		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 (Flora & Fauna): Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Impacts to terrestrial vegetation communities and habitat **Nature:** **a) Direct ecosystem destruction and modification impacts** • Planned direct impacts to Zululand Lowveld/ secondary grassland for tower establishment. • Planned direct impacts to Zululand Lowveld/ secondary grassland for access road establishment. • Accidental direct impacts to Zululand Lowveld secondary grassland / by heavy machinery during construction i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Erosion and/or sedimentation of Zululand Lowveld/ primary and secondary grassland due to soil and vegetation clearing and landcover disturbance during construction. • Pollution of Zululand Lowveld/ primary and secondary grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Cumulative Impacts**: • Small impacts to Zululand Lowveld. Degradation of Northern Zululand Sourveld type and less representative grassland for meeting conservation targets. **Residual Impacts**: Degradation of Zululand Lowveld type and less representative grassland for meeting conservation targets. Small impacts to Northern Zululand Sourveld.	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1 Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures	**LOW**
	MEDIUM	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.5. Runoff, erosion and sediment control • 7.2.6. Hazardous substances / materials management • • 7.2.7. Invasive Alien Plant control • • 7.2.9. Noise, dust and light pollution minimisation • • 7.2.10. General rehabilitation guidelines • • 7.2.11. Construction phase monitoring measures	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 2: Impacts to terrestrial biota / species **Nature:** **a) Direct ecosystem destruction and modification impacts** • Fauna displacement and/or flora and fauna fatalities during planned direct impacts to Zululand Lowveld/ secondary grassland habitat for pylon establishment. • Fauna displacement and/or flora and fauna fatalities during planned direct impacts to Zululand Lowveld/secondary grassland habitat for access road establishment.	**MEDIUM**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1 Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.2. Threatened and Protected Plant Search and Rescue • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.8. Prohibitions related to animals • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
• Fauna displacement and/or flora and fauna fatalities as a result of accidental direct impacts to Zululand Lowveld/ secondary grassland habitat by heavy machinery during construction i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Erosion and/or sedimentation of Zululand Lowveld/ primary and secondary grassland due to soil and vegetation clearing and landcover disturbance during construction. • Pollution of Zululand Lowveld/ primary and secondary grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Cumulative Impacts**: Negligible cumulative impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed. **Residual Impacts**: Negligible residual impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed.		**Refer to section 7of Appendix E2 for general mitigations on:** • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.5. Runoff, erosion and sediment control • 7.2.6. Hazardous substances / materials management • • 7.2.7. Invasive Alien Plant control • • 7.2.9. Noise, dust and light pollution minimisation • • 7.2.10. General rehabilitation guidelines • • 7.2.11. Construction phase monitoring measures	

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Impacts to local and regional landscape ecological processes **Nature:** **a) Direct ecosystem destruction and modification impacts** • Ecosystem fragmentation during planned direct impacts to Zululand Lowveld for tower establishment. • Ecosystem fragmentation during planned direct impacts to Zululand Lowveld for access road establishment. • Fauna displacement and/or fatalities as a result of accidental direct impacts to Zululand Lowveld by heavy machinery during construction i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Zululand Lowveld due to soil and vegetation clearing and landcover disturbance during construction. • Flora and fauna stress and/or fatalities as a result of pollution of Zululand Lowveld due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Cumulative Impacts**: none **Residual Impacts**: none	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1. Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.2.1. Tower Access and Haulage Roads • 7.2.2. Threatened and Protected Plant Search and Rescue • 7.2.3. Demarcation of 'No-Go' areas and construction corridors • 7.2.4. Method Statements for working in sensitive ecosystems • 7.2.8. Prohibitions related to animals • 7.2.10. General rehabilitation guidelines • 7.2.11. Construction phase monitoring measures	**LOW**
OPERATIONAL PHASE			
Impact 1: Impacts to terrestrial vegetation communities and habitat **Nature**		**Refer to section 7of Appendix E2 for general mitigations on:** • 7.3.1. Maintenance and management • 7.3.2. Monitoring	

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
1a) Direct ecosystem destruction and modification impacts Accidental direct impacts to Zululand Lowveld/ secondary/ Moist Coast Hinterlandgrassland by heavy machinery during repair and maintenance i.e. poorly planned access roads. **1b) Indirect ecosystem disturbance impacts** • Erosion and/or sedimentation of Zululand Lowveld/ primary and secondary/ Moist Coast Hinterland grassland due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Pollution of Zululand Lowveld/ primary and secondary grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. **Residual Impacts**: Negligible residual impacts to Zululand Lowveld if the recommended mitigation measures are effectively implemented. **Cumulative Impacts**: Negligible degradation of Zululand Lowveld if the recommended mitigation measures are effectively implemented.	**MEDIUM**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.3. Service Road Stormwater Management • 7.3.2. Monitoring	**LOW**
Impact 2: Impacts to terrestrial biota / species **Nature** **a) Direct ecosystem destruction and modification impacts** Fauna displacement and/or fatalities as a result of accidental direct impacts to Zululand Lowveld habitat by heavy machinery during repair and maintenance i.e. poorly planned access / service roads. **b) Indirect ecosystem disturbance impacts** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Zululand Lowveld habitat due to soil and vegetation clearing and landcover disturbance during repair and maintenance.	**LOW**	**Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.1. Tower Location and Design Recommendations • • 7.1.2. Tower Access and Service Roads • • 7.3.1. Maintenance and management • • 7.3.2. Monitoring **Refer to section 7of Appendix E2 for general mitigations on:** • 7.1.3. Service Road Stormwater Management • 7.3.2. Monitoring	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
• 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 repair and maintenance. **Cumulative Impacts**: Negligible cumulative impacts if all mitigation measures are implemented effectively. **Residual Impacts**: Negligible residual impacts if all mitigation measures are implemented effectively.			
Impact 3: Impacts to local and regional landscape ecological processes **Nature:** **a) Direct ecosystem destruction and modification impacts** • Fauna displacement and/or fatalities as a result of accidental direct impacts to Zululand Lowveld by heavy machinery during dismantling and rehabilitation i.e. poorly planned access roads. **b) Indirect ecosystem disturbance impacts**	**LOW**	• 7.1.1. Tower Location and Design Recommendations • 7.1.2. Tower Access and Service Roads • 7.3.1. Maintenance and management • 7.3.2. Monitoring	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
• Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of Zululand Lowveld due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Flora and fauna stress and/or fatalities as a result of pollution of Zululand Lowveld due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. **Cumulative Impacts**: none **Residual Impacts**: none		7.1.3. Service Road Stormwater Management 7.3.2. Monitoring	

7.3.3 Avifauna Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	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			
Potential collisions with the Towers **(Greenfields GF3A and GF1A paired tower options)** **Nature:** 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 80 m tall Greenfields GF3A and GF1A telecommunication towers at sites in a 'vulture movement corridor' and close to Hluhluwe-Imfolozi Park, southeast of Ulundi, KZN.	**HIGH**	The proposed Greenfields GF3A tower site is considered fatally flawed as it is situated on the edge of a very marked escarpment directly over the White Imfolozi River with forest patches and tall cliffs suitable for breeding by several of the vulnerable threatened bird species in close proximity. Mitigation by ensuring no lateral support cables are used for the tower is not considered sufficient mitigation in these highly sensitive circumstances. The Greenfields GF1A site is also situated in a sensitive location but not as sensitive as Greenfields GF3A. Both of these towers are also particularly tall at 80 m.	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Cumulative impacts: 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 identification and ruling out of fatally flawed towers, such as one of those involved here, being even more imperative. **Residual risks**: Residual risks in the case of the proposed Greenfields GF3A tower remain too high even with mitigation for this option to be further considered.			
Potential collisions with the Towers **(Greenfields NGF2 and VGF1 paired tower options)** **Nature:** 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 65-70 m tall Greenfields NGF2 and VGF1 telecommunication towers at sites in a 'vulture movement corridor' and close to Hluhluwe-Imfolozi Park, southeast of Ulundi, KZN. **Cumulative impacts**: Potential cumulative impacts that could translate into population level impacts on affected populations of large birds, especially threatened species, 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 measures even more imperative. **Residual risks:** There will be some residual risk even if the mitigation measures are implemented as large flying birds could still collide with the towers themselves, either existing ones or new towers, especially under conditions of low visibility, e.g. in mist.	**HIGH**	The proposed Greenfields NGF2 tower is situated in a fairly sensitive position, much more so than Greenfields VGF1. It would be essential that both towers though be constructed without lateral support cables as the indispensable mitigation measure.	**MEDIUM**

7.3.4 Heritage & Palaeontological Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Direct or physical impacts, implying alteration or destruction of heritage features (Greenfield VGF 1 & Greenfield 3A Tower) **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 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).	**LOW**
Impact 2: Burial site destruction (Greenfields NGF 2) **Nature**: An informal burial site with an unknown number of graves marked only with stone cairns. Due to the dense vegetation cover encountered on the site, it was impossible to determine the size and extent of the burial site. In addition, a number of middens, i.e., archaeological sites also occur in the vicinity. These are probably remains of houses and can therefore be linked to the graves.	**MEDIUM**	• (1) Avoidance/Preserve: It is recommended that the tower site is moved at least 100m to the west, north or south of the present position. • The burial site should be fenced off by means of a wire fence or danger tape with a buffer zone of at least 50m for the duration of construction activities.	**LOW**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Historic period: Shembe Church site (Greenfield 1A Tower) **Nature**: Sites of religious significance such as the one identified adjacent to the project area derive from one of the African Initiated Churches, or independent churches, i.e., a Christian church independently started in Africa, rather than by outsiders such as missionaries. In this part of the country, it probably is from the Nazareth Baptist Church, colloquially referred to the Shembe Church, founded by Isaiah Shembe in 1910.	**MEDIUM**	• (1) Avoidance/Preserve: Although the tower would be located some distance from the church site. It would have a big visual impact as well as an impact on the approach to the site. It is recommended that the community is consulted on the placement of the tower and that a final site selection should be done with their input.	**LOW**
Impact 4: 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	**MEDIUM**	• (1) Avoidance/Preserve: It is recommended that the tower site is moved at least 100m to the west, north or south of the present position. • The burial site should be fenced off by means of a wire fence or danger tape with a buffer zone of at least 50m for the duration of construction activities.	**LOW**

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 construction phase will introduce new elements to the visual environment (i.e., construction equipment) that are otherwise uncharacteristic within the context of the site. The existing vegetation cover within the footprint of the construction operations, will be damaged/removed and the underlaying soil will be exposed due to earthworks. This will cause the removal of the plant cover that is part of the baseline character of the site. Unsightly scarring of the landscape will negatively impact on the visual quality of the visual resource and the pristine nature of the site. Visual intrusion can be expected due to the unsightly construction activity and the interference on the views of the surrounding observers. The early construction activities which involve the base preparations, are expected to have a limited ZVI and will only influence observers in close proximity to the 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) **Nature of impact**: Outside the ZMVE and up to 5km, the visual exposure will diminish greatly as the distance between observers and the towers increase. Although detectability of the towers in these zones, are still possible, topographic screening becomes increasingly more relevant due to the topographic variation in the landscape. Residents in these zones will experience a reduced visual exposure. Viewer incidence is expected to be higher due to a larger area being affected, but is still considered relatively low. Beyond the distance of 7-9 km, atmospheric haze and the minute size of a tower in the visual field, renders detectability negligible and visual exposure insignificant. 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 limited to road users on the gravel roads leading to the various villages. Intermitted views of the proposed towers are expected as motorists travel through the study areas. Viewer incidence is expected very low due to the sparse road network and the relatively limited number of vehicles travelling on these dirt roads as a result of the low population density in the study area. **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**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Impact 3: Severity of impacts on the Landscape character (LC) **Nature of impact**: Tourists are not considered an observer group that will enter the ZMVE or even pass through the 5 km distance zone due to the remoteness of the sites. No tourist attractions currently exist near the tower sites. It is however 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 study area does not offer tourism destinations at the moment near any of the four tower sites. The Ophathe Game Reserve and HiP are located outside of the 5km distance zone for all four tower sites. The closest tower site is NGF 2 which is located 5km from the eastern boundary of the Ophathe Game Reserve and more than 12 km from the existing offices and staff accommodation. Figure 13 represents a view from the tower site towards the eastern boundary of the Ophathe Game Reserve. It clearly illustrates the diminishing visibility over such distances and therefore negligible visual exposure is expected from this reserve. **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.	**MEDIUM**
OPERATIONAL PHASE			
Impact 1: Severity of impacts on observers (OB) and landscape character (LC) **Nature of impact**: The completed project will introduce two new towers to a study area that is generally undeveloped and free of similar infrastructure. The presence of these towers will blemish the scenic attributes of the mountains and contrast with their natural character, thereby altering the horizon line and impacting on the generally undeveloped	**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.	**MEDIUM**

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
landscape character. A visual change will be noticeable and will cause visual intrusion to the observers within the ZMVE. The towers are considered relatively tall but slender structures and adding its elevated location, has a large potential ZVI. A mitigating factor is its slender, lattice structure that has a relatively small "visual footprint" and becomes increasingly more difficult to detect over distances further than 5km. **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. **Risk of obtrusive lighting:** Red lights will be installed at the top and halfway down the tower. The specification for these lights is according to SACAA requirements and specify low intensity lights on each leg of the tower at a luminous intensity of 32cd. The rural environment in which the towers are proposed have low lighting conditions due to the widely distributed and low-density development. The addition of more lights will cause a slight visual change, but no obtrusive lighting conditions will be created, therefore the risk of obtrusive lighting is very improbable. In addition, there is an inverse relationship between distance and light intensity - as the distance increases, light intensity decreases.		• 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. •	

7.3.6 Agriculture Potential Impact Assessment

NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS			
Impact 1: Loss of agricultural land (land that is no longer able to be utilized due to construction) **Nature:** Construction activities, Vehicle operation on site, Dust generation and the creation of access roads. **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.	**LOW**	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

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

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

7.4 Do Nothing Alternative Assessment

No go Alternative (compulsory). This is the alternative of not developing the 2x Greenfield 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 communication services for its infrastructures 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 14: 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, littering	P – Low	There are no mitigation measures	P – Low	Low risk

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 upliftment in these	N – High	High risk

		areas will occur as a basic need is being met.		

7.5 **Cumulative Impacts Assessment**

From a visual perspective, a medium risk of cumulative impacts is anticipated. The towers are approximately 10km apart and will be experienced as lone towers but as one starts to move through the study area, these towers adding to the existing towers will result in a compounding effect and blemish the rural/natural landscape character. 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.

In terms of the avifauna, potential cumulative impacts that could translate into population level impacts on affected populations of large birds, especially threatened species, are indeed of great relevance and concern here due to the widespread and accelerating proliferation of powerlines, including those servicing communication towers situated on highly sensitive elevated positions in the landscape, across the South African landscape. This renders the mitigation measures even more imperative.

From a **Fauna & Flora perspective** Negligible degradation of Northern Zululand Sourveld if the recommended mitigation measures are effectively implemented. Negligible cumulative impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed

8 CONCLUSIONS AND RECOMMENDATIONS

The previous chapters of this report together with the specialist studies contained within **Appendix D** 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 Towers by providing a summary of the conclusions of the assessment of the proposed powerline. 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 the key findings & impacts

The specialist findings are summarised as follows:

Aquatic and Wetland Impact Assessment

A total of five watercourses were identified and mapped within 500m of the GF1A site. The closest stream is located 100m to the west of the tower site and was visited onsite. The site visit confirmed that the streams are steep, ephemeral headwater mountains streams of low ecological sensitivity. These watercourses are unlikely to be impacted by the project activities for the following reasons: The very small impact footprint and radius of worst-case indirect impacts of the tower project; • The large distance between the tower site and the nearest watercourse that is 100m to the west, with the other three watercourses being located >200m away from the project site. Four mountain streams were identified and confirmed within 500m of the GF3A site. These Therefore, the project risks to aquatic and wetland ecosystems will be negligible.

A total of twenty-five watercourses were identified and mapped within 500m of the NGF2 site. The closest watercourse (wetland seep) is located 83m to the south-east of the tower site and was visited onsite. The site visit confirmed the closest seep to the site W01 was 83m away and that the remainder of the watercourses were beyond 100m from the site. Therefore, watercourses are unlikely to be impacted by the project activities for the following reasons, The very small impact footprint and radius of worst-case indirect impacts of the tower project and the large distance between the tower site and the nearest watercourse that is 83m to the south-east, with the other watercourses being located >100m away from the project site.

A total of eleven (11) watercourses were identified and mapped within 500m of the VGF1 site. The closest stream is located 118m to the east of the tower site and was visited onsite. The site visit confirmed that the streams are steep, ephemeral headwater mountains streams or seeps. These watercourses are unlikely to be impacted by the project activities for the following reasons: The very small impact footprint and radius of worst-case indirect impacts of the tower project. And The large distance between the tower site and the nearest watercourse that is 118m to the east, with the other watercourses being located >100m away from the project site.

Preferred Option**:** Option 2 has a lot more watercourses within 500m. However, both options will have no measurable impacts to watercourses as long as the mitigation measures provided are effectively implemented. Therefore, there are no clear aspects that would make one option preferable over the other in terms of impacts to freshwater ecosystems and biodiversity. Considering conservation planning, VGF1 is located within a provincial CBA whereas the rest of the towers are not. Thus, one could argue that Option 1 (GF1A and GF3A) is preferable from a watercourses / freshwater ecosystem

perspective. Nevertheless, it is recommended that terrestrial biodiversity / ecosystem and avifauna aspects and impacts be considered as the primary determinants of site selection.

Terrestrial Biodiversity (vegetation and Fauna)

The proposed towers will likely result in small, localised direct and indirect impacts to disturbed and secondary grassland and likely not impact threatened and protected plant or animal species (with the exception of avifauna) provided all mitigation measures outlined in section 7 of this report are strictly adhered to. Of particular note is the importance of ensuring that the footprint of the construction areas like the tower construction area, access roads and storage / laydown areas are minimised in extent and are carefully located and demarcated so as to ensure that no important vegetation and habitat is impacted.

A comparative analysis of the sites suggests that GF3A poses the highest risk as a site to develop given the close proximity of confirmed intact primary grassland, while NGF2 is the most degraded, suggesting that Option 2 (NGF2 and VGF1) should be favoured over Option 1 (GF1A and GF3A) in future planning for the project. The differences are however marginal and, as such, if there are significant impacts to avifauna predicted, avifaunal aspects should determine the preferred option and override the terrestrial biodiversity aspects indicated in this report.

Avifauna Impact Assessment

The proposed GF3A tower option is considered fatally flawed from an avifaunal perspective as it is situated on the edge of a very marked escarpment directly over the White Imfolozi River with forest patches and tall cliffs suitable for breeding by several of the vulnerable threatened bird species in close proximity. Mitigation by ensuring no lateral support cables are used for this tower is not considered sufficient mitigation in these highly sensitive circumstances. This renders the proposed NGF2 and VGF1 tower option as the only alternative option. The proposed NGF2 and VGF1 tower option though should only be pursued if it is considered mandatory that any towers constructed at these localities 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. An informal burial site with an unknown number of graves marked only with stone cairns. Due to the dense vegetation cover encountered on the site, it was impossible to determine the size and extent of the burial site. In addition, a number of middens, i.e., archaeological sites also occur in the vicinity. These are probably remains of houses and can therefore be linked to the graves. Sites of religious significance such as the one identified adjacent to the project area derive from one of the African Initiated Churches, or independent churches, i.e., a Christian church independently started in Africa, rather than by outsiders such as missionaries. In this part of the country, it probably is from the Nazareth Baptist Church, colloquially referred to the Shembe Church, founded by Isaiah Shembe in 1910. From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the proposed mitigation measures as proposed.

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.
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 villages surrounding the four tower sites are widespread and sparsely populated. It has been established that observers inside the ZMVE (i.e., within 2km from the site) will experience the greatest exposure. These residents will experience full and partial views of the proposed towers. A very low viewer incidence is expected due to the low population density.

Outside the ZMVE and up to 5km, the visual exposure will diminish greatly as the distance between observers and the towers increase. Although detectability of the towers in these zones, are still possible, topographic screening becomes increasingly more relevant due to the topographic variation in the landscape. Residents in these zones will experience a reduced visual exposure. Viewer incidence is expected to be higher due to a larger area being affected, but is still considered relatively low.

Beyond the distances of 5km, atmospheric haze and the minute size of a tower in the visual field, renders detectability nearly negligible and visual exposure very limited. An inherent mitigating factor is the tower's slender, lattice structure that has a relatively small "visual footprint". Viewer incidence is very low due to the low population density outside the ZMVE.

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 limited to road users on the gravel roads leading to the various villages. Intermitted views of the proposed towers are expected as motorists travel through the study areas. Viewer incidence is expected very low due to the sparse road network and the relatively limited number of vehicles travelling on these dirt roads as a result of the low population density in the study area.
The study area, encompassing all four sites, are homogenous in their character and are evaluated according to similar attributes. The landscape character sensitivity is considered high and is attributed to the generally undeveloped nature of the study area and its natural vegetation cover that is largely intact, although partially transformed in and around the settlements. These features, in addition to the high degree of topographical variation, panoramic views across the mountains and deep valleys, all contribute to a high scenic quality. High value landscape features are associated with the White-iMfolozi River to the north of the GF1A & NGF2 sites and south of the GF3A site, with its meandering canyon supported by dramatic mountains as a backdrop.

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.
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. Alternative 2 (NGF2 and VGF 1) is the **most preferred alternative** based on the following findings:

- Alternative 2's towers are 10 m and 15 m shorter than alternative 1's towers which makes is marginally smaller and in theory less intrusive;
- The viewshed analyses for alternative 2's towers are noticeably more fragmented in the 5 km zone which represents a smaller impacted area;
- GF3A is only 2 km from the White-iMfolozi River which places it in a highly visible area within close proximity to a landscape feature of high visual quality.

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

8.2. A summary of the positive and negative impacts and risks of the proposed project

A summary of the impact assessments is presented in **Table 15**; 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 15** 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 15: 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 o Direct ecosystem destruction and modification impacts	Low	Low
o Indirect ecosystem disturbance impacts	Medium	
Impacts to terrestrial biota / species	Medium	Low
Impacts to local and regional landscape ecological processes	Low	Low
Avifauna Impact		
Displacement of SCC and non-SCC priority species as a result of disturbance.	Medium	Low
Heritage & Palaeontological Assessment		
Destruction, Damage & Loss of fossil material	Low	Low
Burial site destruction (Greenfields NGF 2)	Medium	Low
Historic period: Shembe Church site (Greenfield 1A Tower)	Medium	Low
Visual Impacts		
Severity of impacts on observers (OB) i.e. Residents inside Zone of Maximum Visual Exposure (ZMVE)	Medium	Low
Severity of impacts on observers (OB) (i.e. Residents outside ZMVE & Motorist)	Low	Low
Severity of impacts on the Landscape character (LC)	Medium	Medium
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 o Direct ecosystem destruction and modification impacts	Medium	Low

○ Indirect ecosystem disturbance impacts		
Impacts to local and regional landscape ecological processes: Fauna displacement and/or fatalities	Low	Low
Impacts to terrestrial biota / species		
Avifauna Impact		
• Potential collisions with the Towers	High	Medium
Heritage & Palaeontological Impact		
Direct or physical impacts, implying alteration or destruction of heritage features (Greenfield VGF 1 & Greenfield 3A Tower)	Low	Low
Burial site destruction (Greenfields NGF 2)	Medium	Medium
Historic period: Shembe Church site (Greenfield 1A Tower)	Medium	Medium
Loss or damage to sites, features or objects of cultural heritage significance	Low	Low
Visual Impacts		
• Severity of impacts on observers (OB) 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. Site specific Environmental sensitivities/ attributes

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 58** have been identified on the site:

- **Protected plants within** 100m of the tower site: A 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 only protected species encountered on the GF1A Tower sites were a single specimen of *Aloe marlothii* located 38m south-west of the site; Tower: At GF3A, a small colony of *Aloe marlothii* are present 30-40m north-east of the tower site, as well as a *Kniphofia sp*. For the VGF1 Tower site, the only protected plant species encountered was Aloe marlothii – 2 individuals located within the 100m buffer of the mast site and nothing located near the NGF2 Tower:
- **Watercourse:** GF1A: Only the ephemeral headwater mountain stream located 100m to the west of the site was verified in the field, for GF3A site two streams north of the tower site were undertaken, these streams were confirmed as ephemeral headwater mountain streams. NGF2: Only 2 watercourse units located 83m to the south-east and 130m to the east were verified in the field and for the VGF1 site there were 2 mountain headwater streams located 118m to the east and 150m to the north-west the field.
- **Heritage:** near the NGF 2 Tower, an informal burial site with an unknown number of graves marked only with stone cairns. Due to the dense vegetation cover encountered on the site, it was impossible to determine the size and

extent of the burial site. In addition, a number of middens, i.e., archaeological sites also occur in the vicinity. Sites of religious significance such as the one identified adjacent to the project area near GF 1A derive from one of the African Initiated Churches, or independent churches, i.e., a Christian church independently started in Africa, rather than by outsiders such as missionaries. In this part of the country, it probably is from the Nazareth Baptist Church, colloquially referred to the Shembe Church, founded by Isaiah Shembe in 1910

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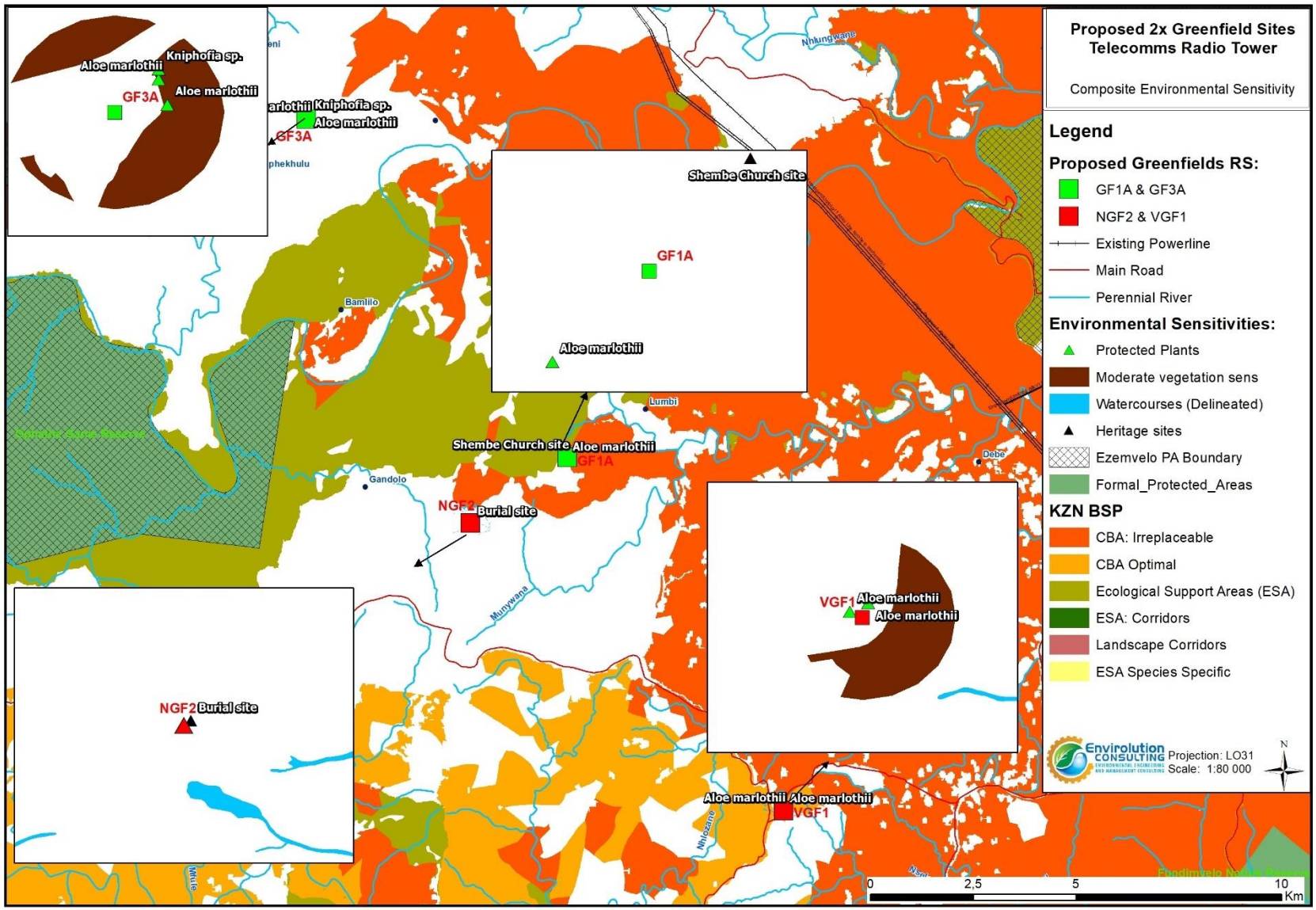

Figure 58: Composite Environmental Sensitivity Map for the proposed **Greenfield Telecommunication** Radio Tower showing areas of high sensitivity

8.4. Comparative analysis of Alternative Sites

According to a comparative analysis undertaken for the sites by the different studies, as summarised in **Table 16**, GF3A site poses the highest risk as a site to develop given the close proximity of confirmed intact primary grassland, while NGF2 is the most degraded, also the GF3A tower option is considered fatally flawed from an avifaunal perspective as it is situated on the edge of a very marked escarpment directly over the White Imfolozi River with forest patches and tall cliffs suitable for breeding by several of the vulnerable threatened bird species in close proximity. In terms of the visual, Alternative 2 towers are 10 m and 15 m shorter than alternative 1's towers which makes is marginally smaller and in theory less intrusive; the viewshed analyses for Alternative 2's towers are noticeably more fragmented in the 5 km zone which represents a smaller impacted area and GF3A is only 2 km from the White-iMfolozi River which places it in a highly visible area within close proximity to a landscape feature of high visual quality.

Table 16: Comparative Assessment Summary

Environmental Aspect	Alternative 1: GF1A & GF3A	Alternative 2: NGF2 & VGF1
Aquatic	**Preferred**	**Not preferred**
Vegetation	**Not preferred**	**Preferred**
Fauna	**Not preferred**	**Preferred**
Avifauna	**Not preferred**	**Preferred**
Heritage	Any	Any
Palaeontology	Any	Any
Visual	**Not preferred**	**Preferred**
Social	Any	Any

Recommendations:

- **Environmentally**: Alternative 2 (NGF2 & VGF1 Towers) is mostly the preferred alternatives for the placement of the Greenfield Tower with the exception of the Aquatic assessment where Alterntive 2 has a lot more watercourses within 500m. However, both options will have no measurable impacts to watercourses as long as the mitigation measures provided are effectively implemented. Thus, one could argue that Option 1 (GF1A and GF3A) is preferrable from a watercourses / freshwater ecosystem perspective. Nevertheless, it is recommended that terrestrial biodiversity / ecosystem and avifauna aspects and impacts be considered as the primary determinants of site selection. **Thus Alternative 2** (NGF2 & VGF1 Towers) **is the preferred option.**

- **Technically**, Eskom has moved away from tubular monopoles as it is very difficult to maintain during its lifetime. We 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, and has **prefers lattice structures designs.**

8.5. Conclusion (Impact Statement)

The proposed Construction of the 2x Greenfield Sites Telecommunication Radio Tower as part of a suite of projects collectively known as the Transnet Coal Link Upgrade Projects. The proposed telecommunication mast would serve as voice and date telecommunication mechanisms for Eskom staff and contractors. The proposed Tower will be located approx. 20km south east of Ulundi within the Ulundi and Mthonjaneni Local Municipality in KwaZulu-Natal. Figure 3 illustrates the project location.

The assessment notes that the majority of the negative impacts associated with the construction of the proposed Greenfield Telecommunication Radio Tower as summarised in Table 15 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 65 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.

Environmental constraints as shown in the environmental sensitivity map (**Figure 58**) 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 in 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 7.3) 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.

8.6. Recommendations

The EAP **recommends** that the **construction of the proposed 2x Greenfield Telecommunication Radio Tower (NGF2 & VGF1 sites) 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 65m and 70m respectively, which is not particularly tall,
    - 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 protected species or plant of conservation concern.

  - 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