



BASIC ASSESSMENT PROCESS
for
THE PROPOSED CONSTRUCTION OF THE NZALO 2x 88kv
POWER LINES NEAR VRYHEID, KWAZULU-NATAL

DRAFT BASIC ASSESSMENT REPORT

Public Review

21 May 2021 to 21 June 2021

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PROJECT DETAILS

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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	Kwa-Zulu 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

SUMMARY OF THE REQUIREMENTS OF APPENDIX 1 OF THE 2014 NEMA EIA REGULATIONS

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

Table 1: 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; v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of	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

<ul style="list-style-type: none"> 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; 	
<ul style="list-style-type: none"> (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— <ul style="list-style-type: none"> (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
<ul style="list-style-type: none"> (j) an assessment of each identified potentially significant impact and risk, including— <ul style="list-style-type: none"> (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
<ul style="list-style-type: none"> (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)
<ul style="list-style-type: none"> (l) an environmental impact statement which contains— <ul style="list-style-type: none"> (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 that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; 	Chapter 8 (section 8.4)
<ul style="list-style-type: none"> (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
<ul style="list-style-type: none"> (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
<ul style="list-style-type: none"> (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)
<ul style="list-style-type: none"> (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 	Chapter 8 (Section 8.4)

	conditions that should be made in respect of that authorisation;	
(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 <i>gazetted</i> by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply	N/A

EXECUTIVE SUMMARY

INTRODUCTION

The proposed construction of the Nzalo 2x 88kV power lines within the eDumbe and the Abaqulusi Local Municipality (Figure 1.1) are 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.

In order to address this request, various projects were proposed including the Construction of 160MVA Nzalo Substation with associated 88kV and 400kV turn-in power lines approximately 15km northeast of Vryheid, KwaZulu-Natal. Environmental Authorisation for this project was secured on 27 October 2015.

Land acquisition process has been completed and, in some instances, servitudes have been negotiated outside of approved corridors. Disputes regarding late estates that could not be resolved in time as well as due to encroachment of settlements that needed resettlement of affected landowners, forced Eskom to look for alternative line routes that were technically feasible. The negotiations outside approved corridors necessitates for a new Environmental Impact Assessment Processes to be undertaken for the Nzalo 2 x 88kV Powerlines.

Hence, it is worth noting that the focus of this assessment is for the environmental authorisation of the proposed deviations outside of the authorised power line corridor, however the maps in this report shows the full length of the line for reference purpose only.

REQUIREMENT FOR A BASIC ASSESSMENT PROCESS

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. Eskom requires an Environmental Authorisation for this project which includes the proposed construction of an overhead powerline, underground cables and substations. 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 this is a proposed electricity generation project and thereby considered to be of national importance, 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 project is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. Eskom requires an Environmental Authorisation for this project which includes the proposed construction of proposed deviations outside of the authorised power line corridor. 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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CONCLUSION (IMPACT STATEMENT)

As summarised in Table 8.1 (see section 8.2), it's been noted that most of the negative impacts associated with the construction of the proposed Nzalo 88kV Powerlines are localised, short-term (i.e. during the construction phase) and can be successfully mitigated to lower significance if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix H. Sensitive ecological features as mentioned in section 8.3 and shown in the environmental sensitivity map (Figure 8.1) could be avoided during the detail design phase of the project, by careful placing of tower footprint within the 500m study corridor. Other features of significance would be the possible occurrence of buried heritage artefacts, graves or fossils, however mitigation measures through monitoring and recording have been proposed for any chance finds/discoveries.

Due to the nature of a powerline, total avoidance of the high environmental sensitivity areas as shown in Figure 8.1 may not be possible. However, it is worth noting that the overall impacts to the above mentioned environmental sensitive features would be less than 3% of the total development footprint, and would be considered acceptable loss. Positive socio-economic impacts are associated with job creation which would materialise during the Construction phase, thus contributing towards the reduction of unemployment rates in local municipalities as the proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Ermelo-Richards Bay Coal Link Upgrade project is therefore a major economic undertaking from which South African citizens can benefit.

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

It is also recommended that a formal communication channel be developed between Eskom and the affected property owners for

planning, evaluation and monitoring purposes. Careful planning and negotiations with land owners will be of crucial importance before finalising the exact placement of the pylons and 31m servitude within the 500 corridor that was evaluated. This will minimise the direct (mostly visual) impacts by investigating slight deviations in the route where necessary.

RECOMMENDATIONS

The EAP **recommends** that the **Proposed Construction of the Nzalo 2x 88kv Power Lines near Vryheid be authorised** as all impacts identified are localised and manageable. 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.

Site-specific conditions to be noted include:

- **Aquatic and Wetland:**
 - The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourse crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided
 - No pylons or towers must be established within or within 50m of any wetlands or riparian areas.
 - Where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following
 - * Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings.
 - * The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.
 - Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 30m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.
 - Demarcation of 'No-Go' areas and construction corridors Prior to the commencement of any construction activities,
- **Terrestrial Biodiversity:**
 - If possible, a slight realignment of the powerline between BN4 and BN5 is recommended to follow the existing road network i.e. P300 and P34-4. This will ensure that powerline is aligned along edges of the primary grassland.
 - The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved.
 - No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.
 - Once the location of the pylons / towers and access / service roads are confirmed, a botanist must visit the footprint sites at the appropriate time of year to identify and map the location of all threatened and protected plants. Once the identity and location of all threatened and protected plants are confirmed, permits to remove and translocate such species must be acquired and a search and rescue plan must be compiled and implemented. This must be undertaken prior to construction commencing.
 - Demarcation of 'No-Go' areas and construction corridors Prior to the commencement of any construction activities,
- **Avifauna:**
 - The entire length of the powerline must be fitted with bird flight diverters at 5m intervals (i.e. high contrast, reflective or moving markers).
 - The line configuration used must ensure that the number of planes of the wires is reduced to the minimum required and there are no ground wires in line with the current best environmental options.

- Ensure that an appropriate bird friendly tower design is chosen and that applicable bird perch brackets are installed e.g. all cables close to poles must be insulated. Pylons / towers should include safe perches located at a safe distance from energised structures.
- **Heritage:** (1) Avoidance/Preserve: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained in situ and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.

General conditions includes

- 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.
- Creation of new access roads should be minimised as far as possible.
- The visual and intrusion impacts are of concern, as well as the negative impact on the property value. In this regard, it is therefore recommended that the entire property for the substations be obtained by Eskom. Should this mitigation measure be implemented.
- 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.
- Rehabilitate construction sites by establishing with indigenous plant species, within the safety specifications for a power line. The 3m servitude for the underground cable servitude should be kept clear of plants to allow maintenance and repairs in future.
- Erosion control measures must be utilised during construction, operations, decommissioning and rehabilitation of the power lines, cables and substations.
- 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

The Draft Basic Assessment Report (BAR) has been prepared by Envirolution Consulting (Pty) Ltd in order to assess the potential environmental impacts associated with the proposed construction of the **Nzalo 2x 88kv Power Lines**. The report is made available for public review for 30-day review period from **21 May 2021 to 21 June 2021** at the following place:

Vryheid Library

Mark Street, Vryheid
034 982 2133

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

Environmental Assessment Practitioner

Name: Sheila Bolingo
Physical Address: Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
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The due date for comments on the Draft Basic Assessment Report is Monday, 21 June 2021.

1 INTRODUCTION

1.1 Project Background

The proposed construction of the Nzalo 2x 88kV power lines within the eDumbe and the Abaqulusi Local Municipality (Figure 1.1) are 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.

In order to address this request, various projects were proposed including the Construction of 160MVA Nzalo Substation with associated 88kV and 400kV turn-in power lines approximately 15km northeast of Vryheid, KwaZulu-Natal. Environmental Authorisation for this project was secured on 27 October 2015.

Land acquisition process has been completed and, in some instances, servitudes have been negotiated outside of approved corridors. Disputes regarding late estates that could not be resolved in time as well as due to encroachment of settlements that needed resettlement of affected landowners, forced Eskom to look for alternative line routes that were technically feasible. The negotiations outside approved corridors necessitates for a new Environmental Impact Assessment Processes to be undertaken for the Nzalo 2 x 88kV Powerlines.

Hence, it is worth noting that the **focus of this assessment** is for the environmental authorisation of the proposed **deviations outside of the authorised power line corridor**, however the maps in this report shows the full length of the line for reference purpose only.

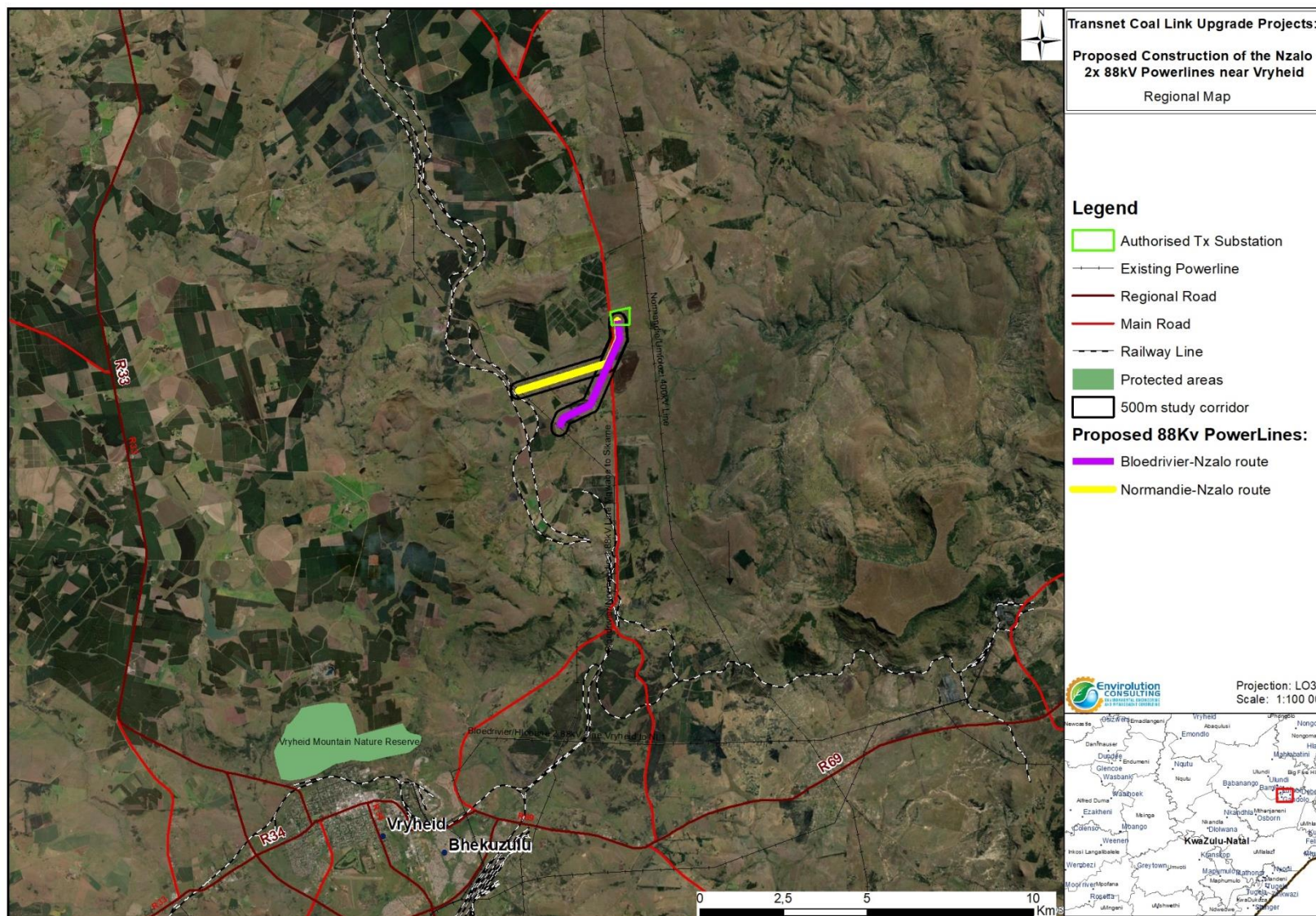


Figure 1.1: Locality map showing the proposed 2x Nzalo power lines (refer to **Appendix A** for A3 maps).

1.2 Previous Environmental Impact Assessment Process

The authorisation for the previous application entailed the construction of a new 400/88 kV, 160MVA Nzalo Substation with associated 88kV and 400kV turn-in power lines approximately 15km northeast of Vryheid, KwaZulu-Natal). An Environmental Authorisations for this project was secured on 27 October 2015 under the following reference number: 14/12/16/3/3/2/633. **Table 1.1** below provides a summary of the legal processes undertaken to date for the proposed Nzalo (Mqwabe) 400kV/88kV, 160MVA Substation with associated 88kV and 400kV turn-in power lines.

Table 1.1: Legal processes undertaken to date

Process	Description	Outcome
Application for Environmental Authorisation in terms of the NEMA EIA Regulations (Government Notice Regulation (GN R) 983,984 and 985 of 4 December 2014, as amended)	BAR was undertaken and documented in the Final BAR Report dated 24 August 2015 (SiVEST, 2015).	The EA issued on 27 October 2015 by DFFE (14/12/16/3/3/2/633)
Appeal pursuant to section 43(2) of the NEMA, 1998 (retracted).	An appeal was lodged against the EA	No appeal was lodged against the EA due to the fact that the project is needed in the area to strengthen the network
Application for amendment of the EA in terms of Regulation 32 of GN R982, as amended.	An amendment process is being applied for to the DFFE to amend the EA for construction of Nzalo (Mqwabe) 400kV/88kV, 160MVA Substation with associated 88kV and 400kV turn-in power lines.	Amendment for the proposed power deviations not approved by the DFFE hence the need for the BA process to authorise these deviations.

All previous correspondences with DFFE are included in **Appendix C** of this report.

Land acquisition process has been completed and, in some instances, servitudes have been negotiated outside of approved corridors. Disputes regarding late estates that could not be resolved in time as well as **due to** encroachment of settlements that needed resettlement of affected landowners, forced Eskom to look for alternative line routes that were technically feasible. These alternative line routes **outside approved corridors** necessitates for a new Environmental Impact Assessment Processes to be undertaken for the Nzalo 2 x 88kV Powerlines.

Hence, it is worth noting that the **focus of this assessment** is for the environmental authorisation of the proposed **deviations outside of the authorised power line corridor**, however the maps in this report shows the full length of the line for reference purpose only.

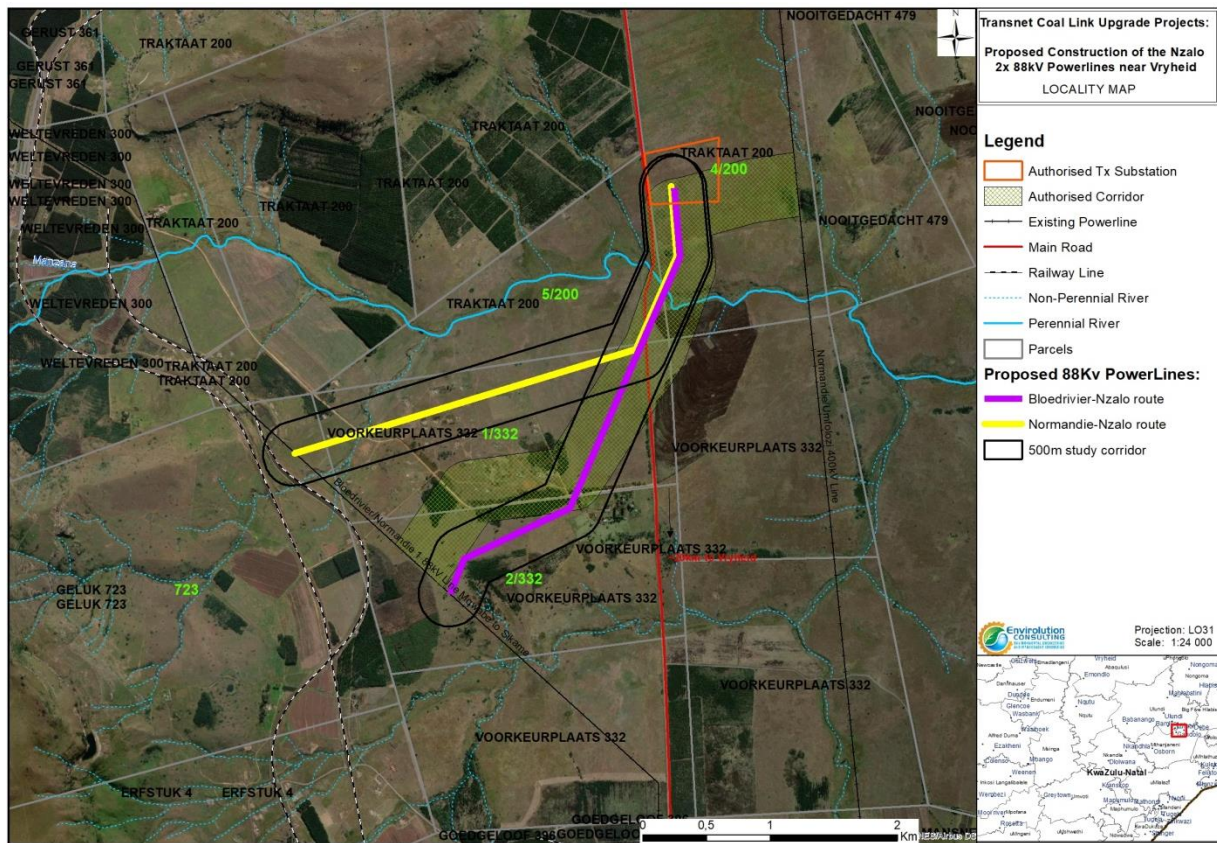


Figure 1.2: Locality Map of the proposed Nzalo 2x Power line project showing the previously Approved Corridor.

1.3 Requirement for a Basic Assessment Process

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as “listed activities”. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. Eskom requires an Environmental Authorisation for this project which includes the proposed construction of proposed deviations outside of the authorised power line corridor. 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 this is a proposed electricity generation project and thereby considered to be of national importance, 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.

1.4 **Project Team**

Environmental Assessment Practitioner

Company Name: Envirolution Consulting (Pty) Ltd
Name: Sheila Bolingo
Physical Address: Vista Place, Suite 1a & 2, No 52, Cnr Vorster Avenue & Glen Avenue, Glenanda
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Fax Number: (0861) 62 62 22
E-mail: sheila@envirolution.co.za

Expertise of the EAP to carry out the EIA procedures

- Cheda Sheila Bolingo, the author of this Basic Assessment holds an Msc degree in Environmental Management with 9 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.
- Gesan Govender, the project manager and Environmental Assessment Practitioner (EAP) responsible for this project, is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 15 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.

Curricula vitae for the project team consultants are included in **Appendix G1**.

Specialists

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
- 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 Proposed Locality

The proposed Power line is located approximately 15km north east of Vryheid within Ward 7 of eDumbe and Ward 7 of the Abaqulusi Local Municipalities which forms part of Zululand District Municipality in the KwaZulu-Natal Province (**Figure 2.1**). The powerlines are part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Line Upgrade.

The proposed 2x 88kV turn-in power line corridor will run west from the respective approved substation sites to tie into the existing Normandie Bloedrivier 88kV traction power line, which runs parallel to the Richards Bay-Ermelo railway line.

Access to the site is to comprise a single-lane gravel access road turning off east from the gravel road that leads to the area of Swembad. The access road will be approximately 200m long. The exact position and type of road will be determined once the power line positions have been confirmed through the negotiation process.

The 88kV power lines will be built at 132kV **but the power line itself will be operated at 88kV** at inception to provide for future capacity increases. Details of the proposed power deviations is detailed in Table 2.1 below, the servitude width will be 32m (i.e. 16m either side of the centre line), **“an assessment” corridor of 500m buffer is being considered** as shown in **Figure 2.1**.

Table 2.1: Details of the proposed power deviations:

Component	Length of Deviation (m)	Total Length of the Servitude, including deviation (m)	Servitude width (m)
88kV Normandie-Nzalo	2600	4671	32
88kV Bloedrivier-Nzalo-	1200	4450	32

Table 2.2: Power line co-ordinates:

Component	Start	Middle	End
88kV Normandie-Nzalo -	27°38'48.38"S; 30°52'3.57"E	27°39'3.36"S; 30°51'11.76"E	27°39'14.15"S 30°50'33.09"E
88kV Bloedrivier-Nzalo-	27°39'28.16"S; 30°51'49.68"E	27°39'40.70"S; 30°51'22.04"E	27°39'49.54"S; 30°51'18.21"E

Please refer to Refer to **Appendix G3** for the full properties' details and powerline co-ordinates

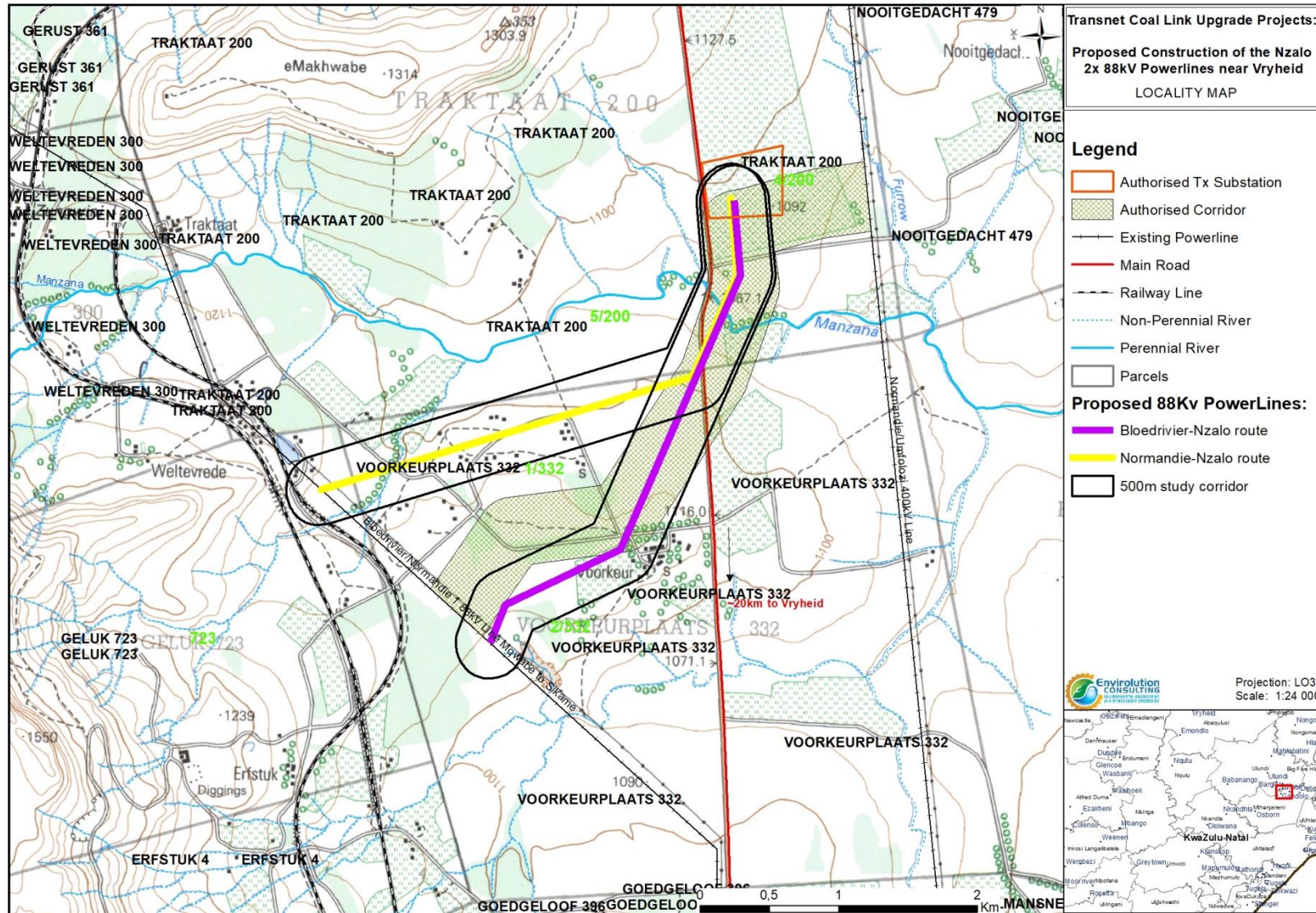


Figure 2.1: Locality Map showing the proposed powerline (including previously Approved Corridor)

2.2 Technical Details

Eskom prefers the proposed steel lattice structures as the design to be used (refer to **Figure 2.2**). A steel lattice structure is considered as the most appropriate technology, and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by standard Eskom specifications and best international practice.

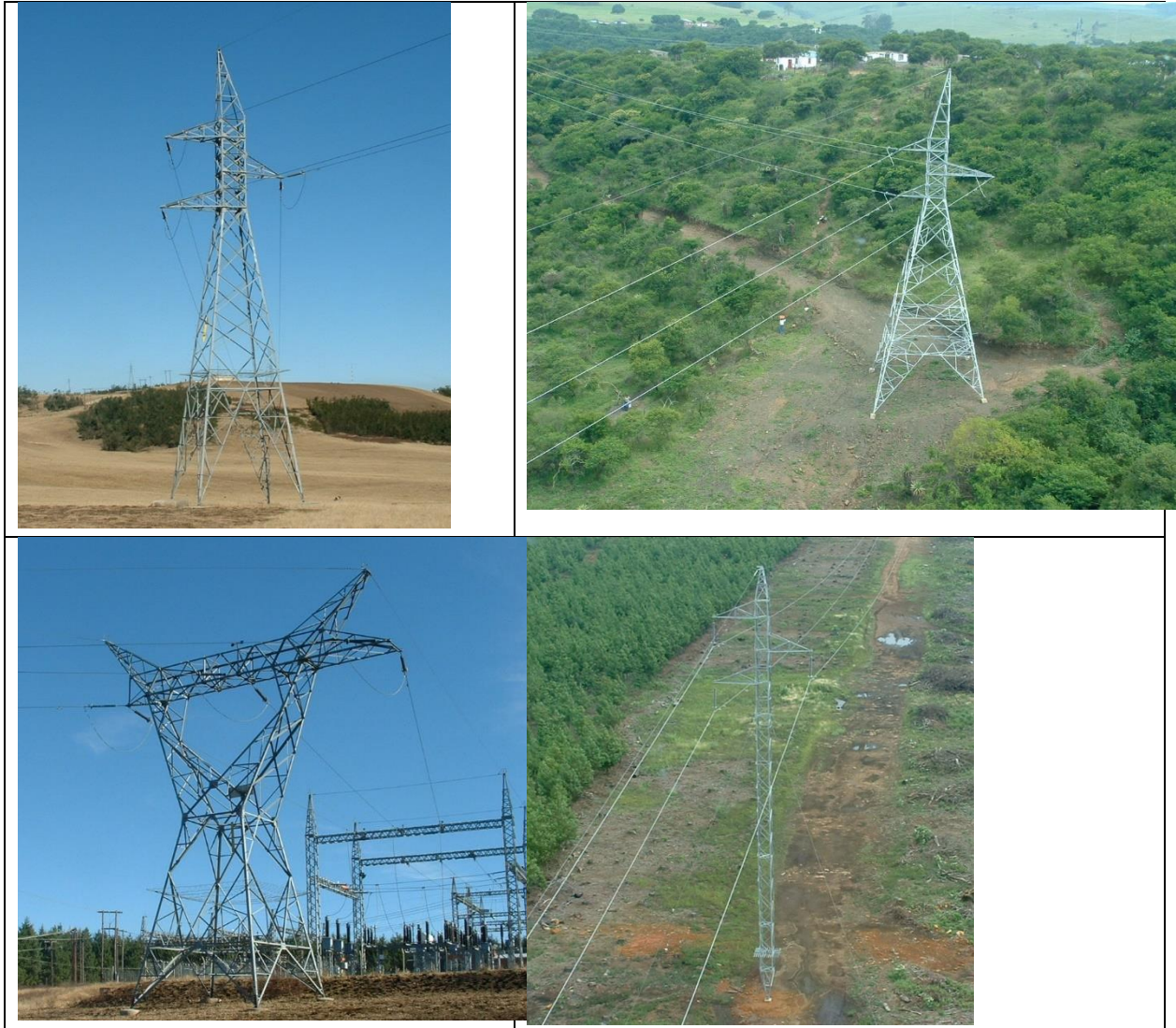


Figure 2.2: Examples of Proposed Steel Lattice Structures

2.3 Alternatives Description

Appendix 2 Section 2 (h)(i) of the EIA Regulations, 2014, requires that all S&EIR processes must identify and describe alternatives to the proposed activity that are feasible and reasonable'. Different types or categories of alternatives can be identified, e.g. location alternatives, type of activity, design or layout alternatives, technology alternatives and operational alternatives. The 'No Go' or 'No Project' alternative must also be considered. Not all categories of alternatives are applicable to all Projects. The following describes the potential alternatives identified as well as reasons why some were not assessed.

2.3.1 Site and Routes alternatives

As part of the previous BAR Process in 2015 by Sivest, alternative routes were considered for the powerline and alternative substation sites. Since the previous EA was granted on 27 October 2015, Eskom proceeded with purchasing the approved substation site and for the approved powerline route (thus landowner negotiations have been undertaken). However, Eskom realised that they cannot proceed with construction due to settlement encroachment. Therefore, to undertake a new application for Environmental Authorisation (EA) as part of the 2014 EIA Regulations, as amended (07 April 2017). All proposed amendments fall within negotiated farms and no additional landowners will be affected; options have also been signed with the affected landowners. Therefore, no feasible alternative sites for the alternative routes can be considered and assessed at this stage.

2.3.2 Layout alternative

There are therefore no layout alternatives, the placement of the power line towers and any associated access roads will be required to be in line with Eskom's technical requirements, as well as specific landowner requirements. Tower positions will be negotiated within the 500m power line corridors being considered. This corridor allows for the possible avoidance of environmentally sensitive areas identified through this Basic Assessment process.

2.3.3 No-go alternative

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current status quo. However, should Eskom and Transnet not proceed with the development of the proposed **the Nzalo 2x 88kV Power Lines Project**, the necessary electrical input into the Transnet railway system will not be present. This will prevent Transnet from increasing the locomotive traffic between Richards Bay, KwaZulu-Natal and Ermelo, Mpumalanga and subsequently prevent increased coal transport to Richards Bay harbour for export. The proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Ermelo-Richards Bay Coal Link Upgrade project is therefore a major economic undertaking from which South African citizens can benefit.

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

2.4.1 The Need for the Project at a Regional level

The KwaZulu-Natal PSDF (2011) indicates in Section 1 Introduction, that the PSDF (2011) serves as a spatial expression to the Provincial Growth and Development Strategy (PGDS) (2011). The PGDS (2011) states under 3.7.2 Strategic Objective 4.2.: Development of Road and Rail Networks that "*Freight will continue to be transported via a combination of road and rail...The development of nodes in the interior of the Province and the enhancement of rail, airfields and corridors will be crucial in this development.*" The Coal Rail Link is identified as one of the existing infrastructures that "greatly complement and expand existing opportunities for manufacturing and trade" if upgraded and further developed. The proposed Nzalo Power line is considered an upgrade of the Coal Link railway line by providing additional electrical capacity. This will increase the operational capacity of the railway line.

The Strategic Objectives of the PGDS (2011) are directly in line with the 18 identified Strategic Integrated Projects

(SIP) of the South African National Infrastructure Plan (2012). The proposed Ermelo-Richards Bay Coal Link Upgrade project is considered a SIP project and satisfies the conditions of SIP 2 and SIP 10 (refer to question 14 in this section for more information).

The proposed project is necessary to increase the electricity capacity of the Transnet railway between Richards Bay and Mpumalanga to respond to increased coal transport demands. This project is designated as part of a "Strategic Infrastructure Project" to aid in the continued development of the mining and export industry of South Africa.

2.4.2 The Need for the Project at a Local level (Community Need)

The "need and desirability" of the local community as reflected in an IDP for the area, is considered within the EIA. In the South African context, developmental needs (community needs) are often determined through the above planning measures (IDP, SDF and EMF).

The proposed development is aimed at increasing the export capacity of South African coal to international consumers. The Abaqulusi Spatial Development Framework (2020-2021) identifies the coal line corridor, which runs from Richards Bay, through Vryheid and Paulpietersburg and on to the mining areas of Mpumalanga, as an important route in the national rail and road network. The coal mining sector has been identified in the IDP as one of the key economic sectors due to the high demand of coal nationally and internationally. The proposed development therefore indirectly supports the Abaqulusi SDF by providing increased electricity provisions to the railway to increase coal transport for export to Richards Bay.

Like the KwaZulu-Natal PSDF (2011), the eDumbe Local Municipality Final IDP (2020-2021) identify Development of Road and Rail Networks as one of the strategic goals for infrastructural development. Further the IDP identifies indirect employment opportunities associated with a development, of the type and scale, such as the proposed Nzalo development. The following support services; e.g. engineering support, equipment maintenance and support; are already present within the area due to the historic mining activities. The future need for these services by the proposed development may contribute to job creation and poverty alleviation within the area.

The Zululand District Municipality SDF (2013) goal 4.2 to addresses PGDS Strategic Goal 4 on Strategic Infrastructure by proposing to i) Establish a dedicated freight link: Durban Port to Inland Hub and ii) Expand Coal Rail Link.

This proposed development will increase South Africa's national capacity to export coal internationally, increasing national revenue and benefitting all South African Citizens. The construction and operational phases of the proposed development may provide a number of jobs opportunities within the local municipalities affected, eDumbe and Abaqulusi, alleviating some of the high unemployment levels in the area. These positive social impacts along with the proposed mitigation methods as set out in the EMPr (Appendix E) will ensure that the positive impacts outweigh the negative environmental impacts of the proposed development.

2.4.3 The Desirability for the Project on the proposed Project site

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

- **Geographic Location:** Existing power line servitudes and railway lines are already present in the area. The proposed development will increase the volume of goods that would be transported along the existing railway

line. Therefore, based on the existing power line infrastructure in the area, the location factors favour the land use of in terms of the development of the Power lines project.

- **Land use:** The site is located mostly within low grade agricultural land, but portions of the routes do traverse areas of higher agricultural value and areas with protected vegetation species present. The proposed development will have minimal impact on the current agricultural activities in the area. Currently the predominant land use in the area is agriculture and will be favourable to the proposed land use. Although the proposed power line routes in some areas traverse natural vegetation in good condition, alien vegetation is present at identified locations (refer to Botanical Specialist report in Appendix E) which may be controlled as part of the construction and operational mitigation measures. The environmental impacts associated with the proposed development are projected to be low after implementation of mitigation measures (refer to EMP in Appendix F) making the proposed development the best practicable environmental option for the identified land.
- **Land availability:** Availability of level land of sufficient area can be a restraining factor for a development of this magnitude. Land acquisition process has been completed and, in some instances, servitudes have been negotiated outside of approved corridors. Disputes regarding late estates that could not be resolved in time forced Eskom to look at alternative routes that were technically feasible. The negotiations outside approved corridors necessitate for a new Environmental Impact Assessment Processes to be undertaken for the Nzalo 2 x 88kV Powerlines. Due to encroachment of settlements, Eskom has decided to apply for a deviation of the authorised corridor to ensure that resettlement of affected landowners is avoided, which is a more costly and high negative social impact option.
- **Availability of services in support of Project:** The proposed power line will require water and electricity resources; however, these will be provided through trucked water and diesel generators. Construction waste will be generated during the construction process. Any excavated material not suitable for re-use will be disposed of at a licensed land-fill site in Vryheid or Paulpietersburg. Hazardous material generation is not anticipated, however should small quantities be produced, these would be disposed of at the closest Hazardous Landfill site. Proof of capacity from the Municipality for services will be included in the Final BAR.
- **Site access:** the site can be readily accessed via a single-lane gravel access road turning off east from the gravel road that leads to the area of Swembad. The exact position and type of access roads cannot be determined until the power line positions have been confirmed through the servitude negotiation process. It is therefore recommended that the final road and power line alignments be submitted to the competent authority once these are confirmed and prior to construction.

2.4.4 How the principles of environmental management as set out in section 2 of NEMA have been taken into account in the planning for the proposed Project

The principles of NEMA have been considered in this assessment through compliance with the requirements of the relevant legislation in undertaking the assessment of potential impacts, as well as through the implementation of the principle of sustainable development where appropriate mitigation measures have been recommended for impacts which cannot be avoided. In addition, the successful implementation and appropriate management of this proposed Project will aid in achieving the principles of minimisation of pollution and environmental degradation.

The EIA process has been undertaken in a transparent manner and all effort has been made to involve interested and affected parties, stakeholders and relevant Organs of State such that an informed decision regarding the Project can be made by the Regulating Authority.

The general objectives of Integrated Environmental Management have been taken into account for this EIA report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, maximise benefits, and promote compliance with the principles of environmental management.

Therefore, this project 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 eDumbe and Abaqulusi municipalities both 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 Required Services

Clearance Requirements: It is anticipated that a 6m strip will be cleared to facilitate access and construction, except where tower erection and stringing requires more space. Eskom have their internal guidelines and standards for Bush Clearance and Maintenance within Overhead Power line Servitudes. This document provides minimum clearances for overhead conductors that will need to be taken into account in the formulation of any power line development.

Access will be required during both the construction and operation / maintenance phases of the power line life cycle. Access roads will enable the transportation of construction material as well as construction teams to the site and facilitate maintenance activities once the power line has been constructed. The following can be noted at each section of the line: Where no access roads/tracks exist, the access points and roads will be negotiated with the relevant landowner, and will be established during the construction phase. Access roads will be constructed up to a width 4m.

Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management as well as the Environmental Management Programme (EMPr), which will be compiled for the construction phase. It must be noted that Stormwater drainage systems form part of the previously authorised scope of works.

Construction Site Camps: The power line construction contractor would need to set up at least one site camp but this does not necessarily need to be near the power line route. The contractor may however prefer to use a fully serviced site at another location. The contractor will be encouraged to utilise already disturbed areas for construction camp purposes, in order to minimise cumulative impacts. It is likely that a number of construction camps would need to be established for the construction period.

Sewage: A negligible sewage flow is anticipated for the duration of the construction period. Chemical toilets will be utilised during construction, and the contractor will ensure regular treatment of these facilities. The toilets will be serviced regularly, as specified by the final site specific EMPr.

Solid Waste Disposal: It is anticipated that construction waste will be comprised mainly of spoil material from clearing activities as well as metal and cabling off-cuts. Spoil material excavated, such as topsoil and subsoil, will be used on site as per the management programme for the construction phase and the associated mitigation / control measures in the EMPr. Excess spoil will be removed from site and appropriately disposed of. Non-biodegradable waste will be immediately trucked to the nearest registered waste disposal facility for appropriate disposal or recycling.

Water & Electricity: Water will be required for potable use and in the construction of the foundations for the towers. The water will be sourced from approved abstraction points at locations closest to the area of construction. The construction team might have temporary connection and supply of electricity from the existing network. Diesel generators will be utilised as an option for the provision of electricity.

Concrete Batching: Concrete batching will be required for the foundations of the distribution line towers. The following guidelines are contained in the Eskom specification for Transmission Line Towers and Line Construction:

- (a) The Contractor shall be responsible for negotiating the site of his batching plant (if required) and the conditions under it may be established, with the landowner. The Contractor shall be responsible for the proper management of the batching plant.
- (b) Upon completion of works, the ground of the batching plant area shall be rehabilitated and the site cleaned and left as it was found and to the satisfaction of the Supervisor and landowner.
- (c) The use of local water for concrete must first be negotiated with the landowner and the appropriate authorities. Such water is to be analysed and accepted by the Project Manager

2.6 Construction of Power Lines Procedure

Eskom uses the following procedure² for the construction of their new transmission lines.

2.6.1 Planning

The Transmission System Planning Department of Eskom are the system network planners which formulate five-year, ten-year or 20-year Transmission Development Plans (TDP), which are strategic documents aimed at identifying the entire infrastructure required throughout South Africa for the transmission of electricity. All projects initiated by the Eskom planners have to be in line with the requirements stipulated in the TDP. All projects which are initiated are thoroughly investigated to ensure that they are both viable and feasible before being approved for implementation.

²*Eskom Fact Sheet: Construction of power lines*

2.6.2 Appointment of EIA Practitioners

Once a project is internally approved to be investigated, the Eskom Land and Rights Department initiates the process of the Environmental Impact Assessment (EIA). In the case of this project, a Basic Assessment Process was followed by Envirolution Consulting (Pty) Ltd. The purpose of the process is as follows:

- To identify both the positive and the negative impacts on the environment, communities and the local economy;
- To identify the impact on the proposed infrastructure;
- To recommend all possible mitigation measures for each impact identified; and
- To develop a plan for implementing the mitigating measures.

All the available information has now been gathered and collated into this document called the Basic Assessment Report (BAR), to be submitted to the decision making authority, the National Department of Forestry, Fisheries and Environment (DFFE). The document will provide the DFFE with all the alternative routes assessed during the BA process and recommend the least impacting route for authorisation. If authorised, the DFFE will issue an Environmental Authorisation, which will allow Eskom to implement the project. An Environmental Authorisation (EA) normally stipulates all conditions that should be adhered to before construction can commence. One such condition would be to finalise an Environmental Management Programme (EMPr) for approval by DEA before construction can commence. During construction, an Environmental Compliance Officer (ECO) must be employed to ensure that the specifications of the EA and EMPr are adhered to.

2.6.3 Land and rights acquisition

Once a positive uncontested Environmental Authorisation has been granted, the process of securing the servitude or title of the said portions of land will commence. To achieve this, the following activities have to be completed:

- The legal boundaries are identified for each property affected by the project;
- The legal ownership of each property is identified;
- An independent property evaluator is appointed to determine the market value of the affected properties; and
- Negotiations are conducted by Transmission negotiators with each lawful landowner to acquire the rights to construct power lines over their properties. Rights are also acquired from affected statutory bodies and mineral right holders.

All land and rights acquired for the purpose of building power lines are registered at the Deeds Office accordingly under title deeds or servitudes.

2.6.4 Survey and line design

Topographical surveys are conducted subsequent to identifying and securing servitudes. The survey information is used by the design engineers to design the tower foundations, structures, buildings, and the exact placement of structures. The draft EMPr (part of this EIA) will be finalised when all the profiles and local site plans are available (after EA has been given). The EMPr will outline all activities to be undertaken, where such activities are to take place, responsible persons, all possible environmental or social impacts, mitigation measures, rehabilitation plans, monitoring methods, the frequency of monitoring as well as performance indicators. The

EMPr is a legally binding document which is used to ensure that Eskom adheres to all conditions of the Environmental Authorisation and EIAR.

2.6.5 Construction

A procurement process is followed to identify a suitable construction contractor. During this process all potential contractors are invited to bid for the implementation of the project. Various factors are considered when appointing these contractors. Factors considered include but are not limited to; capacity, legal status, adherence to all Eskom standards (i.e. safety, quality, and environment) and other legislated regulations, policies and procedures.

In this regard, the following simplified sequence will be followed during the construction of the overhead power line:

- Vegetation clearance and gate erection;
- Establishment of construction camp, pegging of structures;
- Construction of access roads (where required);
- Construction of foundations;
- Assembly and erection of structures;
- Stringing of conductors;
- Rehabilitation of disturbed area and protection of erosion sensitive areas;
- Testing and commissioning; and
- Operation and routine maintenance.

2.6.6 Rehabilitation & Maintenance

After the project has been completed, all affected properties are rehabilitated to their original status. Landowners sign off release forms to confirm the rehabilitated status.

Vegetation in servitudes needs to be kept under control to allow access and to prevent the spread of veld fires. This will be undertaken by experienced contractors and permission will be obtained from land owners where access is required over private property

The management of power line servitude is dependent on the details and conditions of the agreement between the landowner and Eskom, and are therefore site-specific. These may, therefore, vary from one location to another. However, it is a common occurrence that there is a dual responsibility for the maintenance of the servitude:

- Eskom will be responsible for the tower structures, maintenance of access roads, watercourse crossings, and gates and fences relating to servitude access.
- The landowner will retain responsibility for the maintenance of the land and land use within the servitude (e.g. cropping activities, veld management, etc.).

Exceptions to the above may arise where, for example dual use is made of the access roads and gates or specific land use limitations are set by Eskom within the servitude which directly affects the landowner (e.g. forestry). Maintenance responsibilities are, ultimately, clearly set out in the servitude agreement.

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 3.1** contains the listed activities in terms of the EIA Regulations (as amended) and includes a description of those project activities which relate to the applicable listed activities.

Table 3.1 BA Listed Activities Applicable applied for to be authorise

Listed activities	Description of project activity that triggers listed activity
<p>Activity 11 of Listing Notice 1 (GNR 327, 07 April 2017): Development of facilities or infrastructure for the transmission and distribution of electricity</p> <p>(i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p>The proposed development (power line) will be constructed outside the urban area and will transmit electricity of up to 88kV.</p>
<p>Activity 12 of Listing Notice 1 (GNR 327, 07 April 2017): The development of</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square meters or more where such development occurs, —</p> <p>(a) Within a watercourse;</p>	<p>The erection of power line pylons of to be located within 32m of a watercourse. A low-level crossing or culvert of more than 100 m² will be constructed within the watercourse for access roads associated with the power line.</p>
<p>Activity 19 Listing Notice 1 (GNR 327, 07 April 2017):</p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse</p>	<p>The construction of access roads required for the construction and maintenance activities of the power line will require infilling or removal of 10m³ or more of material into/from the watercourse for the placement of culverts.</p>
<p>Activity 27 Listing Notice 1 (GNR 327, 07 April 2017):</p> <p>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.</p>	<p>The proposed development entails the development of powerlines which is considered a linear activity and as such, this activity would not be triggered. However, the proposed development may result in the clearance of more than 1 hectare but less than 20 hectares of indigenous vegetation for the ancillary infrastructure such as site camps.</p>
<p>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</p> <p>(d) Kwazulu-Natal:</p> <p>v. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; or</p> <p>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;</p>	<p>The project is proposed within Critical Biodiversity Areas /Ecological Support Areas identified in the KZN Conservation Plan as well as Sensitive areas as identified in an environmental management framework.</p>

<p>Activity 14 of Listing Notice 3 (GNR 324, 07 April 2017): (ii) infrastructure or structures with a physical footprint of 10 square metres or more; (d) Kwazulu-Natal: vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; viii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority</p>	<p>Power line pylons of more than 10 m² will be located within 32m of a watercourse on sites identified as Critical Biodiversity Areas (CBAs) and within the KZN bioregional plans.</p>
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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 3.2**, where the level of applicability of the legislation or policy to the activity/project is detailed.

Table 3.2: Relevant legislative and permitting requirements applicable to the proposed project

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>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.</p> <p>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.</p> <p>In terms of GNR 326 of 2014 (as amended), a Basic Assessment Process is required to be undertaken for the proposed project.</p> <ul style="list-style-type: none"> • <i>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.</i> • <i>In terms of the EIA regulations, the construction of the proposed power line will trigger the need for a Basic Assessment process under the NEMA EIA Regulations of 2014 (as amended) in Listing Notice 1 & 3</i> 	<p>Department of Forestry, Fisheries and Environment (DFFE) – competent authority</p> <p>KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZN EDTEA)</p>
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a</p>	<p>DFFE</p> <p>KZN EDTEA</p>

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	<p>project holistically, and to consider the cumulative effect of a variety of impacts.</p> <p>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.</p>	
<p>National Water Act (Act No 36 of 1998)</p>	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>A water use license (WUL) is required in terms of Section 21(c) and 21 (i) of the National Water Act. If wetlands or drainage lines are impacted on, or the regulated area of a watercourse (being the riparian zone or the 1:100yr floodline whichever is greatest).</p>	<p>Department of Water and Sanitation (DWS)</p>
<p>National Environmental Management: Air Quality Act (Act No 39 of 2004)</p>	<p>S18, S19, and S20 of the Act allow certain areas to be declared and managed as “priority areas.”</p> <p>Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.</p> <p>GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas</p>	<p>DFFE</p> <p>Local Municipality</p>
<p>National Heritage Resources Act (Act No 25 of 1999)</p>	<ul style="list-style-type: none"> » S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including <ul style="list-style-type: none"> » 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 m² 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 m²; or the re-zoning of a site exceeding 10 000 m² 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. <p>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</p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>AMAFA</p>
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p>	<p>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.</p> <p>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</p>	<p>DFFE</p> <p>KZN EDTEA</p>

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	<p>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.</p> <p>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.</p> <p><i>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.</i></p>	
National Forests Act (Act No. 84 of 1998)	<p>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”</p> <p>GN 908 provides a list of protected tree species.</p> <p><i>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.</i></p>	Department of Forestry, Fisheries and Environment (DFFE)
National Veld and Forest Fire Act (Act 101 of 1998)	<p>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.</p> <p>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.</p> <p><i>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.</i></p>	Department of Forestry, Fisheries and Environment (DFFE)
Hazardous Substances Act (Act No 15 of 1973)	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly 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.</p> <ul style="list-style-type: none"> » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and 	Department of Health

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	<p>» Group V: any radioactive material.</p> <p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p> <p><i>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</i></p>	
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)</p>	<p>The Minister may by notice in the <i>Gazette</i> publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>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.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> » The containers in which any waste is stored, are intact and not corroded or in any other way rendered unfit 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. <p><i>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.</i></p>	<p>DFFE: Chemicals and Waste Management</p> <p>KZN EDTEA: General waste</p>
<p>National Road Traffic Act (Act No 93 of 1996)</p>	<ul style="list-style-type: none"> » 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. 	<p>Provincial Department of Transport</p>

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	<i>An abnormal load/vehicle permit may be required to transport the various components to site for construction.</i>	
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. <i>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.</i>	DFFE
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 <ul style="list-style-type: none"> • Direct Nature management; and • Direct protected areas management <i>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.</i>	KZN EDTEA Ezemvelo KZN wildfire (EKZWN)
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; <ul style="list-style-type: none"> • Schedule 3, 7 and 8 of includes the lists of protected fauna and flora species. <i>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.</i>	KZN EDTEA Ezemvelo KZN wildfire (EKZWN)
KwaZulu-Natal Systematic Conservation Plan (KZNSCP, 2012)	The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats. <i>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.</i>	Ezemvelo KZN wildfire (EKZWN)

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;
- KwaZulu-Natal Spatial Development Framework
- District and Local municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).

- Municipal by-laws and guidelines.

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 form DFFE (attached in Appendix C)**.

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 includes 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

The project has previously received environmental authorisations (EA), Land acquisition process has been completed and, in some instances, servitudes have been negotiated outside of approved corridors. Disputes regarding late estates that could not be resolved in time forced Eskom to look at alternative routes that were technically feasible. The negotiations outside approved corridors necessitate for a new Environmental Impact Assessment Processes to be undertaken for the Nzalo 2 x 88kV Powerlines.

4.2 Public Participation Undertaken

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

- Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- Giving written notice to:
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

- (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority.
- Placing an advertisement in:
 - (i) one local newspaper; and
 - (ii) in at least one provincial newspaper.
 - Open and maintain a register/ database of interested and affected parties and organs of state.
 - » Release of a Draft EIA Report for Public Review
 - » Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

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

4.2.1 Stakeholder and land owner Identification

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

Table 4.1: Key stakeholder groups identified during the EIA Process

Organisation	I&APs type	Designation	First Name Last Name
Department of Environment, Forestry & Fisheries	National	Biodiversity Directorate	Seoka Lekota
KZN Department of Economic Development, Tourism and Environmental Affairs.	Provincial Authority	EIA Coordinator:	Kacy Rengasamy
KZN Department of Economic Development, Tourism and Environmental Affairs (Zululand District Municipality)	Provincial Authority	Assistant Director: Environmental Impact Assessment Environmental Services	Sbusiso Ndwande
Ezemvelo KZN Wildlife	Provincial Authority	Conservation Planning	Nerissa Pillay/ Dinesree Thambu-Moodley
Department of Water & Sanitation (Pongola-Umzimkulu WMA)		Water Quality Management	Lwandle Sibango
Department of Water and Sanitation	Provincial Authority	Acting Deputy Director: Water Quality Management:	Mr Strini Govender.
Department of Agriculture, Forestry & Fisheries (DAFF)	Provincial Authority	Directorate: Forestry Regulations and Oversight	Wiseman Rozani Jeffrey Maivha Ayanda Mnyungula

KZN Department of Roads & Transport	Provincial Authority	Chief Director: TIRS: Ladysmith	Ms. B. Nogwanya
KZN Department of Roads & Transport	Provincial Authority	Manager : Road Infrastructure Develop & Management	Judy Reddy
KZN Department of Agriculture and Rural Development	Provincial Authority	Head of Department (personal assistant: Zakithi Mathenjwa)	Mr Siza Sibande
KZN Department of Cooperative Governance and Traditional Affairs	Provincial Authority	Head of Department	Mr T Tubane
KZN Department of Public Works	Provincial Authority		Xolile Ntanzi Meryl Naicker
KZN Provincial Heritage Authority (AMAFA)	Provincial Authority	Archaeology sites Impact Assessments Archaeology Permits	Bernadet Pawandiwa
KZN:COGTA (Zululand District)		Deputy Director	
Zululand District Municipality	Local Authority	Development Planning Dept	Stefan Landman BP Mnguni
Zululand District Municipality	Local Authority	Municipal Manager:	SP Mosia
eDumbe Local Municipality	Local Authority	Municipal Manager	Mr MP Khathide
eDumbe Local Municipality	Local Authority	Mayor's Office Manager: PA Bandile	Ms Z Msibi
eDumbe Local Municipality	Local Authority	Office of speaker: PA: Thando	Hlatshwayo
eDumbe Local Municipality	Local Authority	Director Planning & Development	Acting Director CT Buthelezi
eDumbe Local Municipality	Local Authority	Ward 7 Cllr	Cllr M S Zulu
eDumbe Local Municipality	Local Authority	Municipal Manager	Mr MP Khathide
AbaQulusi Local Municipality	Local Authority	Municipal Manager:	Mr B. Ntanzi
AbaQulusi Local Municipality	Local Authority	Director: Development & Planning	Mr. S. Landman
AbaQulusi Local Municipality	Local Authority	Speaker Office	Mr. MB Khumalo PA: Nonkululeko Nzuza
AbaQulusi Local Municipality	Local Authority	Environmental officer Office	Ms Buyi Gumbi
AbaQulusi Local Municipality	Local Authority	Ward 7 Cllr	Mr Xolani Jacob Zungu

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 D8**). 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 D1 & D2**

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 D2**.

4.2.5 Public Review of the Draft Basic Assessment Report

i. Stakeholder:

English and isiZulu Adverts was placed in the local Newspapers notifying registered I&APs of the availability of the draft BAR. The draft BA Report was publicly made available to all registered I&AP's from from **21 May 2021 to 21 June 2021** at the following places:

- **VRYHEID 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

- Zululand District Municipality
- eDumbe Local Municipality
- AbaQulusi 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;
- 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 D6**.

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 D7**.

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 & IMPACTS

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 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.

5.1.1 Climate

An overview of the key climatic characteristics of the region is provided in **Table 5.1** below.

Table 5.1: Overview of the key climatic characteristics of the region.

Aspect	Description
Elevation Above Mean Sea Level	1072 – 1131m
Mean Annual Precipitation (mm)	902mm
Annual Precipitation Coefficient of Variation (%)	21%
Mean Annual Potential Evaporation (mm)	1 860mm
Mean Annual Temperature (°C)	16.8 °C
Mean Frost Days	11

5.1.2 Topography and Geology

The natural topography is considered varied, ranging between undulating hills and mountainous terrain with a couple of prominent hills forming the western and southern perimeter of the study area. A general downward slope exists from the south west towards the north east. Rivers and streams create shallow depressions in the landscape, but deeper cuts are sometimes present along the foothills of the mountains.

Large areas of the southern African continent are covered by the Karoo Supergroup (**Figures 5.1**). It covers older geological formations with an almost horizontal blanket. Several basins are present with the main basin in the central part of south Africa and several smaller basins towards Lebombo, Springbok Flats and Soutpansberg. An estimated age is 150 – 180 Ma. And a maximum thickness of 7000 m is reached in the south. Three formations overlie the Beaufort Group, they are the Molteno, Elliot and Clarens Formations. The Elliot Formation is also known as the Red Beds and the old Cave Sandstone is known as the Clarens Formation. At the top is the Drakensberg Basalt Formation with its pillow lavas, pyroclasts, etc. (Kent 1980, Snyman 1996). The Beaufort Group is underlain by the Ecca Group which lies on the Dwyka Group.



Figure 5.1: Geological Setting of the study area

5.1.3 Soil and Agricultural Potential

The project site falls under the land class type Ba70 which comprises of dystrophic and/or mesotrophic; red soils widespread. Dystrophic soils are regarded as soil that has suffered marked leaching, such that the sum of the exchangeable Ca, Mg, K and Na (base) cations is $<5\text{cmol/kg}$ clay while Mesotrophic soils sum of the exchangeable Ca, Mg, K and Na (base) cations is $\geq 5\text{cmol/kg}$ clay to $\leq 15\text{cmol/kg}$ clay.

24.3% of soils under the Ba70 soil classification can be classified as Argent Sd11, Richmond Sd12 while 20.5% can be classified as Doveton (Hu27) and Vimy (Hu28) and 13.3% of soils under the Ba70 soil classification can be classified as Avalon (AV26), Bergville (AV27). The soils have clay content varying between 15% and 60% with the average clay content of the site at 43.9%. The soil depth of the area varies between 100mm and 1200mm with the average depth of the site at 883.2mm.

The pockets of cultivated areas are scattered across the region with no visible large scale cultivated area from the Google imagery. Also based on the land use map of the area, there are no commercial agricultural activities in the area except for natural grazing. Although, the area has high potential for agriculture based on the classification indicated in **Figure 5.2**, the agricultural value of the area is low due to lack of agricultural productivity in the area.

Therefore, based on the fact that the site has low agricultural productivity level, the land can be utilized for the proposed Nzalo power line construction. The area required for constructing the power line will not have significant impact on area available for agriculture.

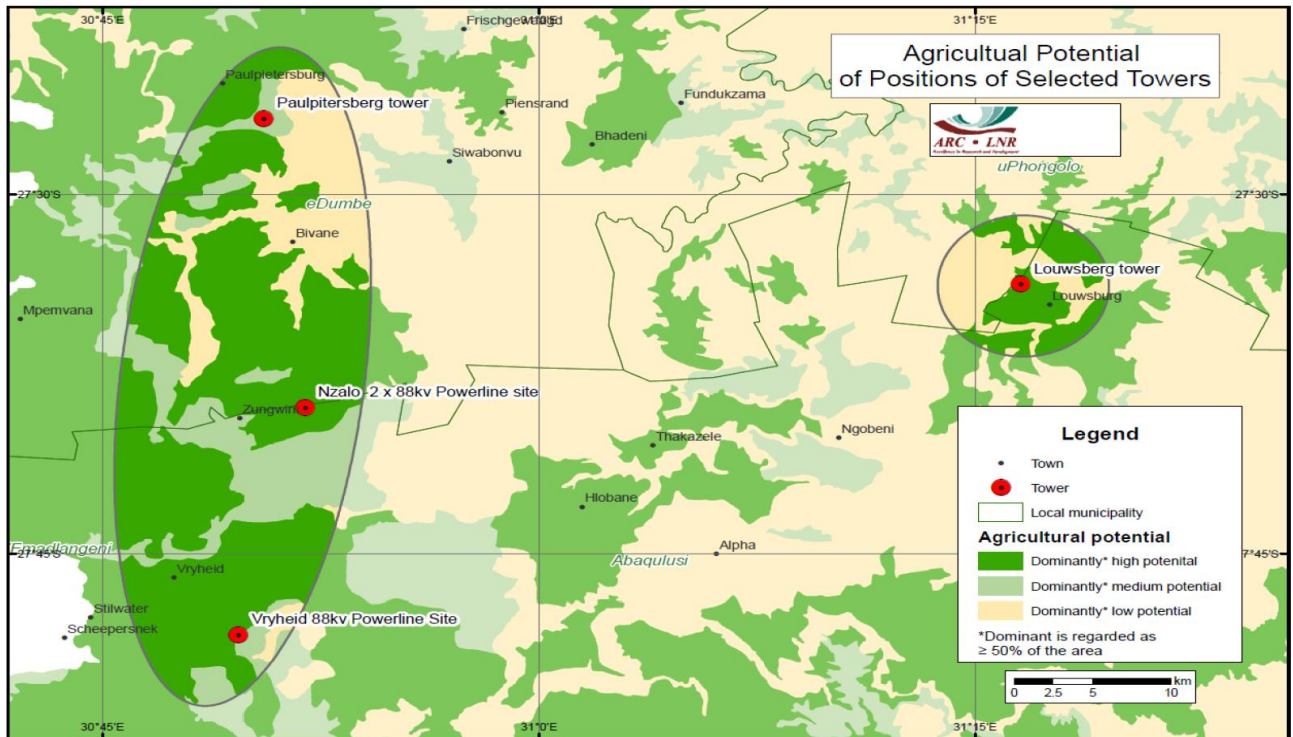


Figure 5.2: Agricultural Potential Map of the Upper Study Area

5.2 Water Resources of the study area

Drainage and River Setting: The Nzalo powerlines sites are located within the upper reaches of Quaternary Catchment W41F. The primary watercourse draining Quaternary Catchment W41F is the upper Manzana River, which is to be crossed by the Nzalo powerline, near the northern extent of the proposed alignment (**Figure 5.3**). An unnamed river, which is a perennial tributary of the Manzana River, drains the region of the study area to the south of the Nzalo powerline site. Local drainage of the Nzalo site is made up of high order tributaries of the upper Manzana River system.

The Manzana River is a right-bank tributary of the Bivane River, which is in turn a right-bank tributary of the Phongolo River. The reach of the Manzana River within the study area was assessed as falling within PES Class C (fair condition / moderately modified) and having a high EIS in the national desktop river PES-EIS assessment (DWS, 2014).

Wetland Setting: The study area falls within the Mesic Highveld Grassland Group 5 wetland vegetation group. No wetlands have been modelled and mapped to occur within the study area as part of the National wetland Map Version 5 as shown in **Figure 5.4**.

Water Resource Management Context: No large / important dams are located within 10km downstream of the project site. The closest dam is the Bivane Dam located ± 33 km downstream at the confluence of the Manzana River with the Bivane River.

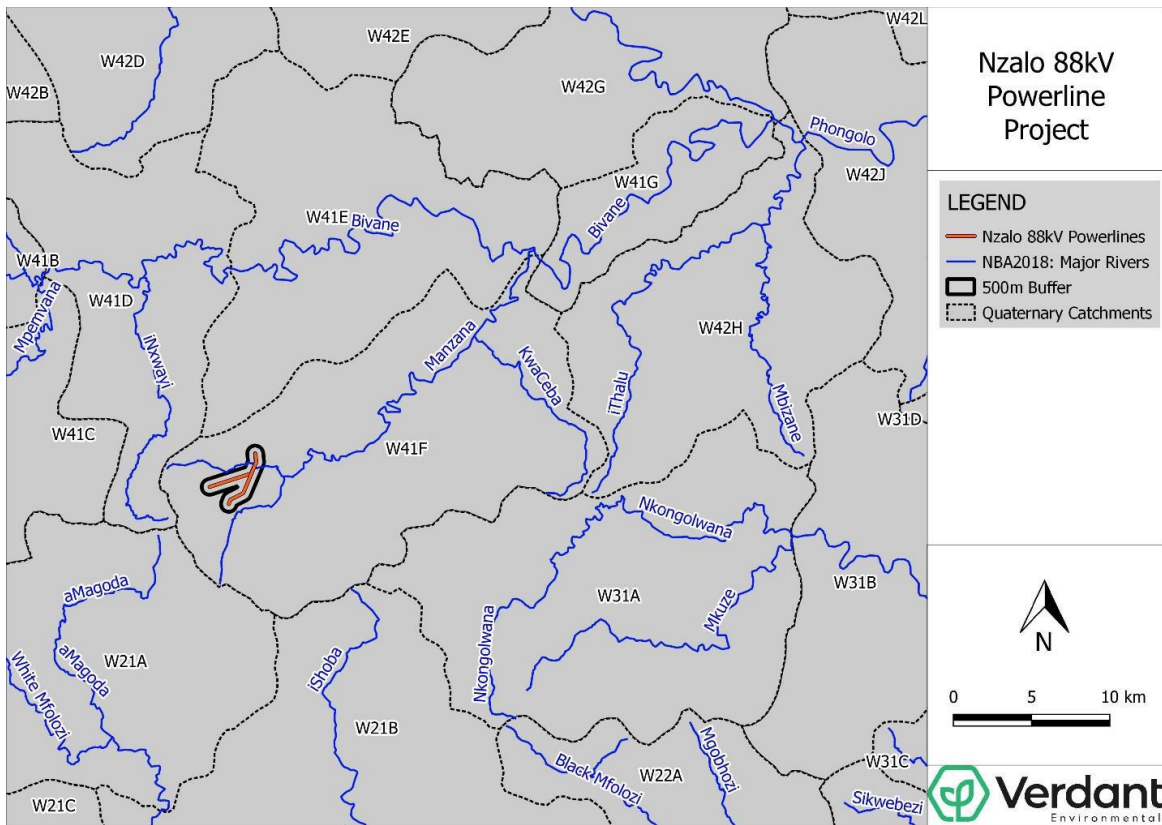


Figure 5.3: Drainage and river ecosystem setting of the study area.

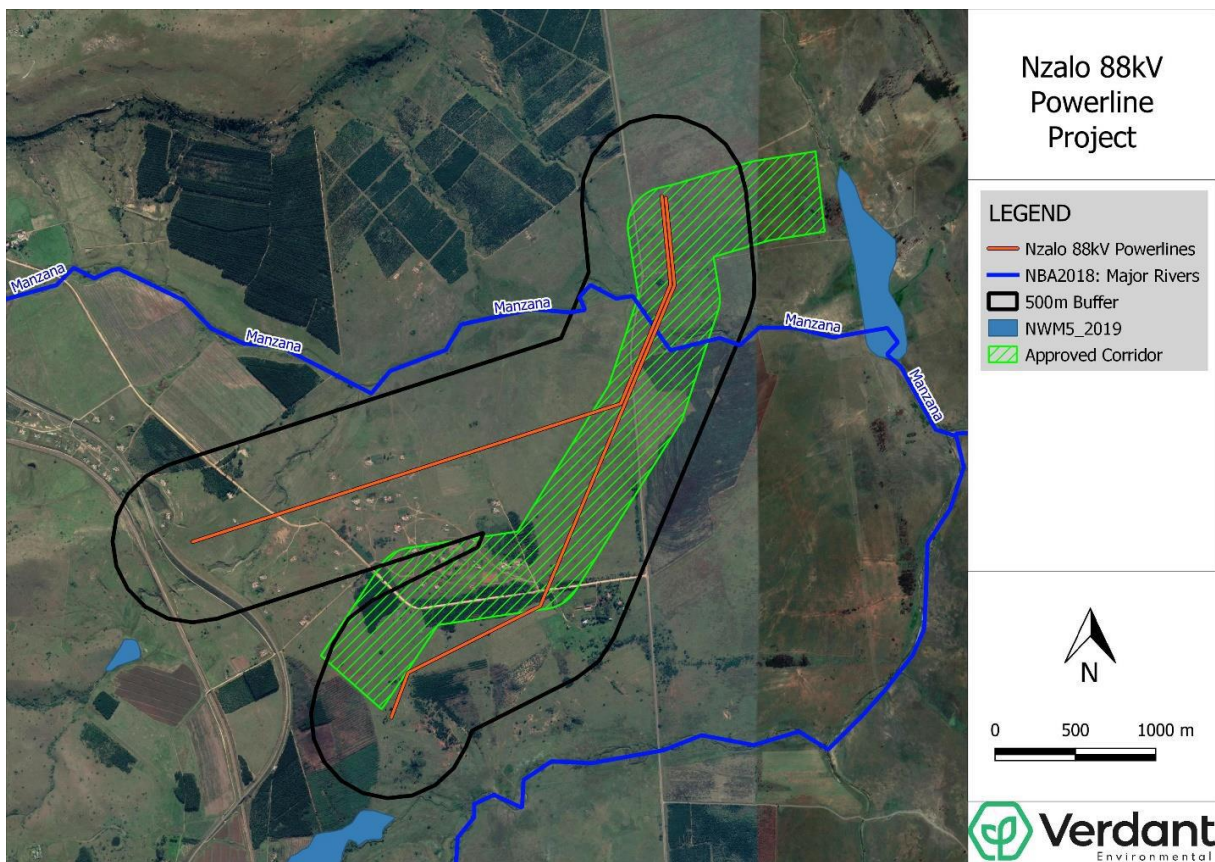


Figure 5.4: Study area in relation to the wetland mapping from the National Wetland Map Version 5

Desktop Mapping within 500m and Confirmation of the Study Area

All the potential watercourses occurring within 500m of the powerline alignments were mapped. The project crosses two (2) riverine units (but only one is impacted by the deviation and no wetland units as shown in **Figure 5.5**). Each of these watercourses could potentially be impacted by the project, depending on the location of powerline pylons. The rest of the rivers and wetlands mapped within 500m of the alignments are unlikely to be impacted and are outside of the 100m powerline buffer zone. It is however important to note that an artificial wetland formed from P34-4 road stormwater runoff that ponds upstream of the road is located within 100m of the powerline alignment. This artificial wetland was only mapped at a desktop level and not formally delineated within the field and assessed.

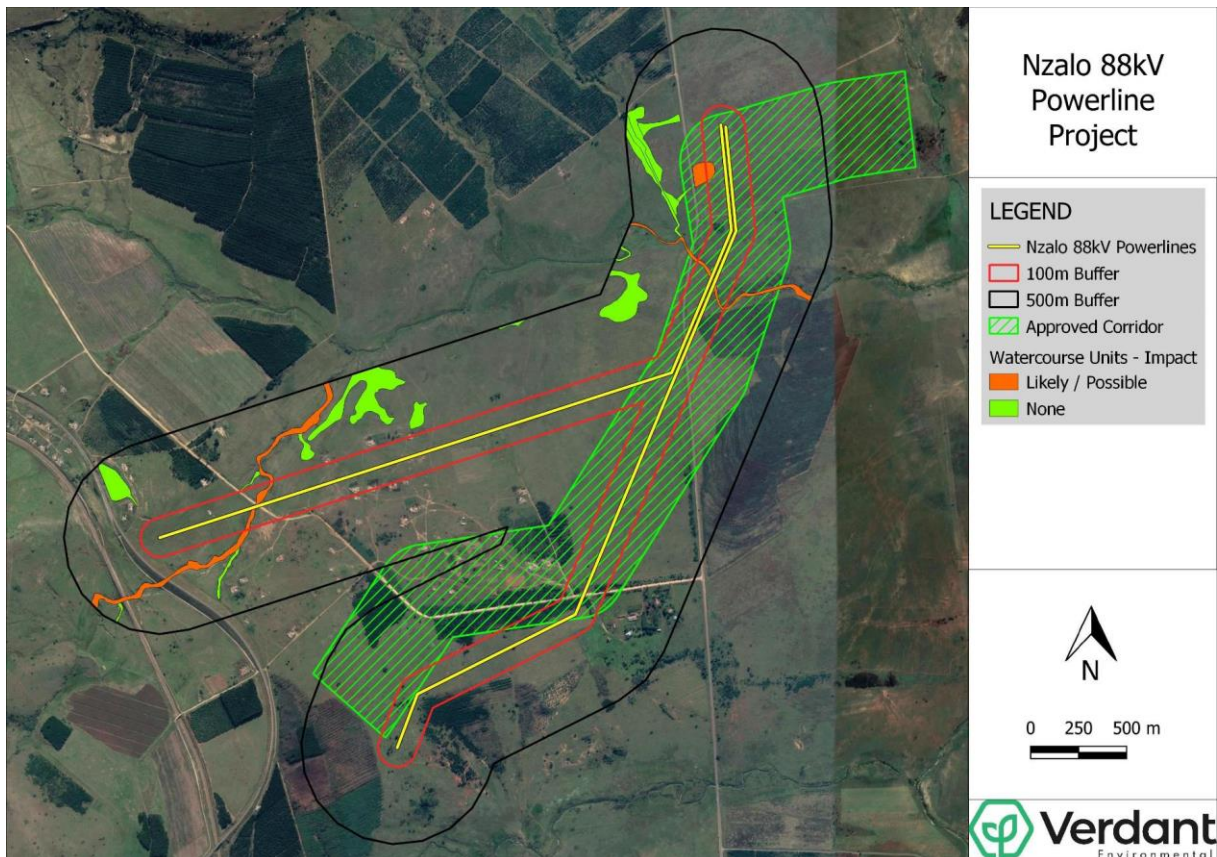


Table 5.5: Watercourses within 500m of the project activities with an indication of the likelihood of impact.

A water use authorization will need to be obtained from the Department of Water and Sanitation for approval of the water use aspects of the proposed activities where lines cross water courses and where pylons are to be placed within the 32m buffer area of wetlands and rivers.

5.3 Terrestrial Biodiversity

5.3.1 Vegetation

Vegetation Overview: The vegetation is shown in National Vegetation Mapping (SANBI 2018) as Paulpietersburg Moist Grassland (Mucina & Rutherford 2006, p. 403). It occurs in KwaZulu-Natal and Mpumalanga, including the: 'Broad surrounds of Piet Retief, Paulpietersburg and Vryheid, extending westwards to east of Wakkerstroom.' It is described as: "Mainly undulating with moderately steep slopes, but valley basins are

wide and flat and mountainous areas occur mostly along the northern and eastern boundary. Tall closed grassland rich in forbs and dominated by *Tristachya leucothrix*, *Themeda triandra* and *Hyparrhenia hirta*. Evergreen woody vegetation is characteristic on rocky outcrops.”

Paulpietersburg Moist Grassland is described as an endangered vegetation type which is poorly protected and with the amount of endemism uncertain (Skowno et al. 2018).

Conservation Context: A summary of the conservation planning and threat status of the ecological features in the study area is provided in **Table 5.2**. Noteworthy features include:

- The terrestrial vegetation type of the study area, Paul Pietersburg Moist Grassland, is currently listed as **Endangered** in the NBA (SANBI, 2018).
- The sub-quaternary catchment within which the study area is located is a **Fish Support Area (Figure 5.6)**.
- Wetlands within the study area are currently listed as **critically endangered** in the NBA (SANBI, 2018)
- Sections of the study area have been earmarked as Critical Biodiversity Area: Optimal3 in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (Figure 5.6).
- A small portion in the north of the study area has been earmarked as Critical Biodiversity Area: Irreplaceable in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (Figure 5.6).

Table 5.2. Key conservation context details for the study area associated with Nzalo powerlines site.

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) (WRC, 2011)	Rivers	Catchment Planning Unit 2481	Fish Support Area	n/a
	Wetlands	FEPA Wetlands	None present in study area	n/a
		Mesic Highveld Grassland Group 5	Seep Wetlands – Critically Endangered	Wetland ecosystem type present within study area noted at site
2018 National Biodiversity Assessment (SANBI, 2018)	Rivers	North Eastern Uplands, Perennial Upper & Lower Foothills Rivers	Least Threatened	River ecosystem types present within study area noted at site.
	Wetlands	Mesic Highveld Grassland Wetland Bioregion	Seep Wetlands – Critically Endangered	Wetland ecosystem type present within study area noted at site
	Terrestrial	Paul Pietersburg Moist Grassland	Endangered	All undeveloped and intact terrestrial / dryland areas
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 865	Available	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		CBA: Optimal	CBA: Optimal	Large portions of the terrestrial / dryland grasslands
		CBA: Irreplaceable	CBA: Irreplaceable	Small portion of the terrestrial / dryland grassland in the north

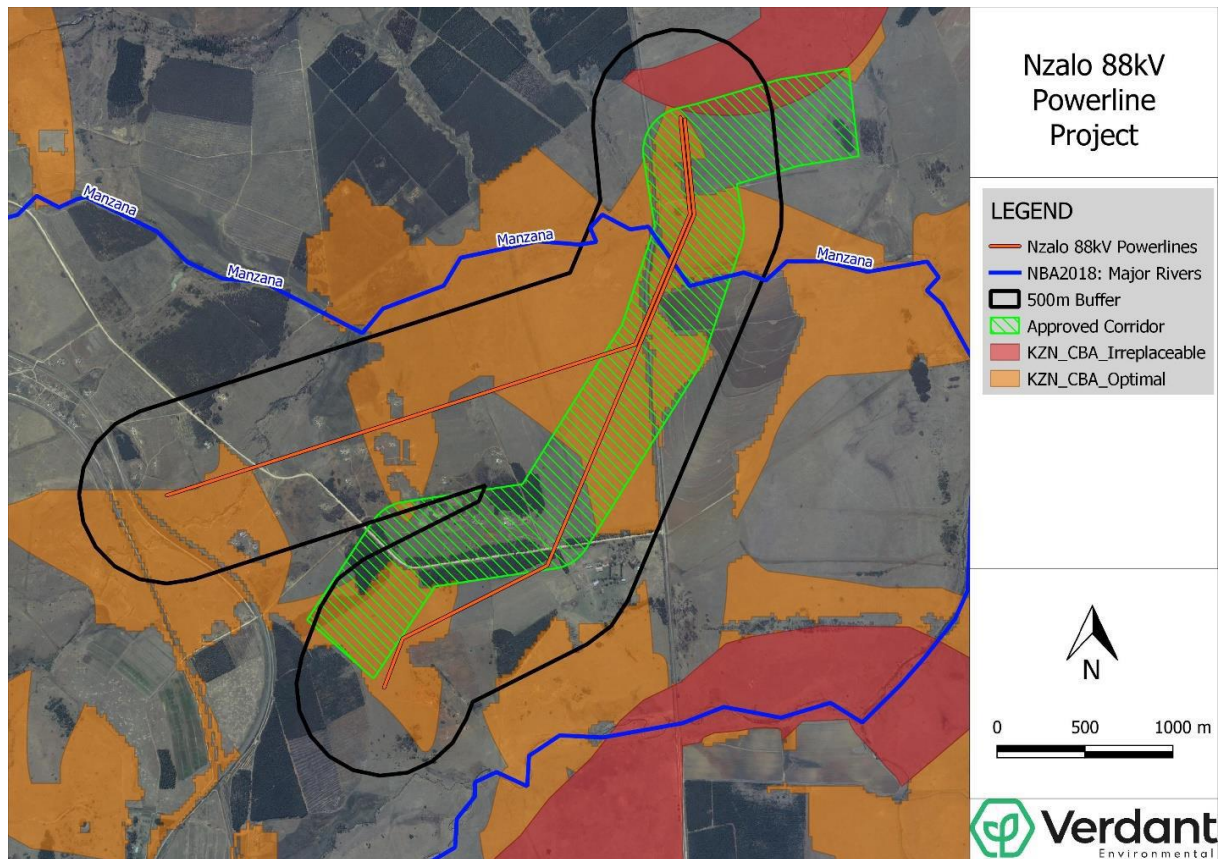


Figure 5.6: KZN terrestrial systematic conservation plan (SCP) CBAs in relation to the study area.

Vegetation Communities along the Alignments:

Distinct vegetation communities were picked up along the alignment and the change points have been marked with labelled placemarks as shown in **Figures 5.7**. The vegetation between each of these placemarks is described in the sections that follow.

- **NNZ1 to NNZ2:** Secondary grassland: Grassland is either secondary or contains a small residue of herbaceous plants, many of which are more disturbance tolerant. Common grass species are *Cymbopogon caesius*, *Hyparrhenia hirta* and *Sporobolus fimbriatus*. Some of the grassland is damp but most appears well-grazed. Some examples of *Habenaria clavata* were also seen.
- **NNZ2 to NNZ3:** Degraded primary grassland with dolerite outcrop: The quality of the grassland improves considerably between points NZ2 and NZ3. The grassland comprises the same dominant species and is somewhat disturbed and not in completely natural condition but it is fair to say it is primary and retains at least moderate species richness. It includes some dolerite outcropping on or near which *Eucomis autumnalis* (protected), *Ledebouria zebrina* (protected) and *Merwillia plumbea* (Near Threatened) occur, but the latter at fewer than 10 plants. Also on the route is the succulent subshrub *Cissus diversilobata*, which although not threatened is endemic to north-western KZN, southern Mpumalanga and western Swaziland and is particularly associated with rocky Paulpietersburg Moist Grassland
- **BN1 to BN2: Secondary grassland:** Grassland is *Sporobolus fimbriatus*/*S. africanus*-dominated. It is secondary or nearly secondary as few herbaceous species occur and there is overexpression of more ruderal and weedy species.

- **BN2 to BN3:** Degraded primary grassland: Grassland is degraded but is not yet secondary as there is some residue of herbaceous plants which are not ruderals. This includes a few occurrences of *Eucomis autumnalis* (protected).
- **BN3 to BN4:** Secondary grassland: Grassland is secondary or nearly secondary.

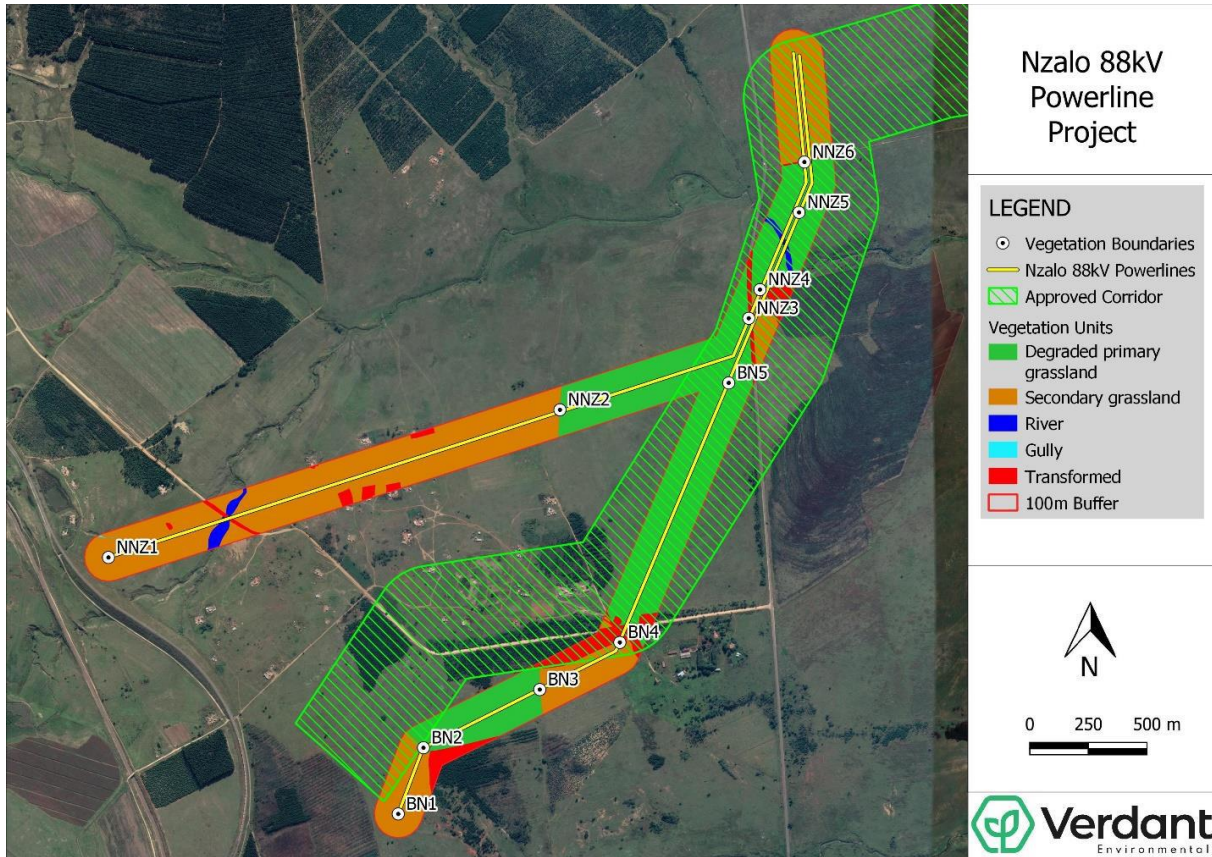


Figure 5.7. Vegetation communities within 100m of the alignments.

Threatened and Protected Species: One threatened plant and several protected plants were observed along and in the vicinity of the powerline alignments. The location of all the threatened and protected plants is shown in Figure 5.8a & b.

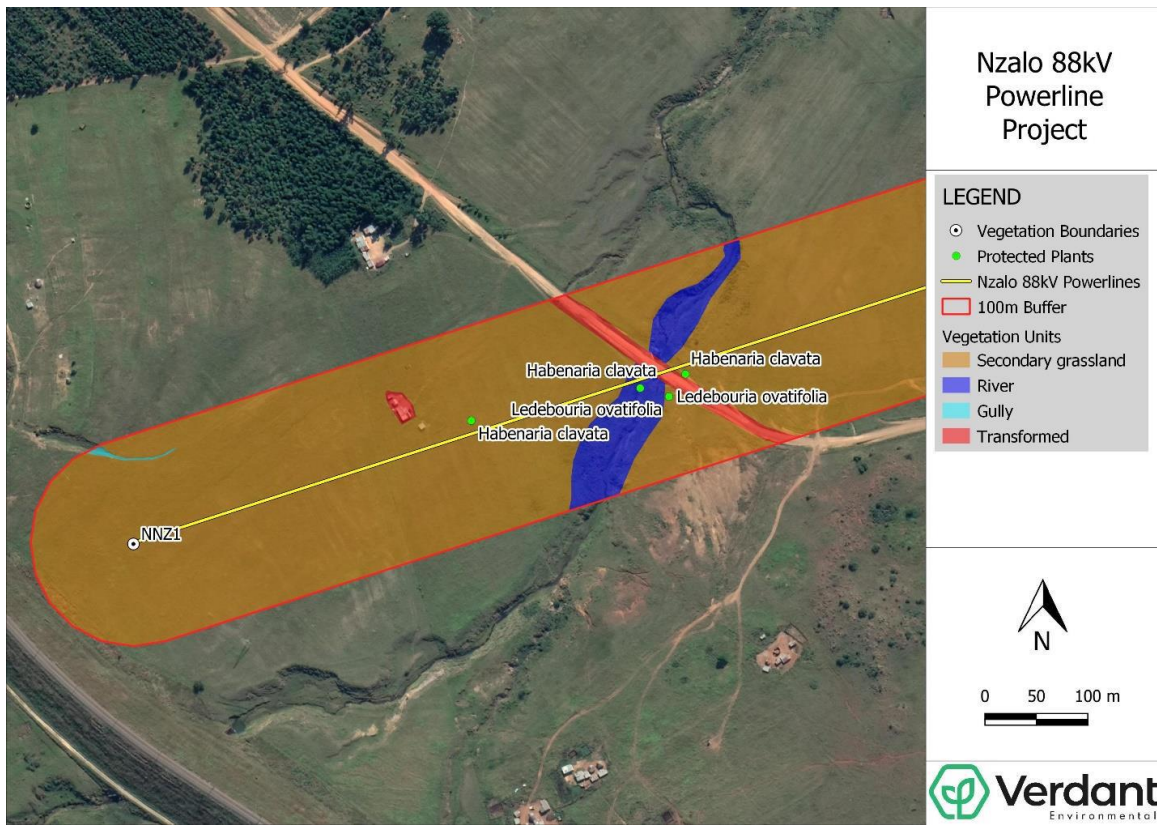


Figure 5.8a. Zoomed in map of the location of threatened and protected species encountered along the western section of the Normandie-Nzalo alignment.

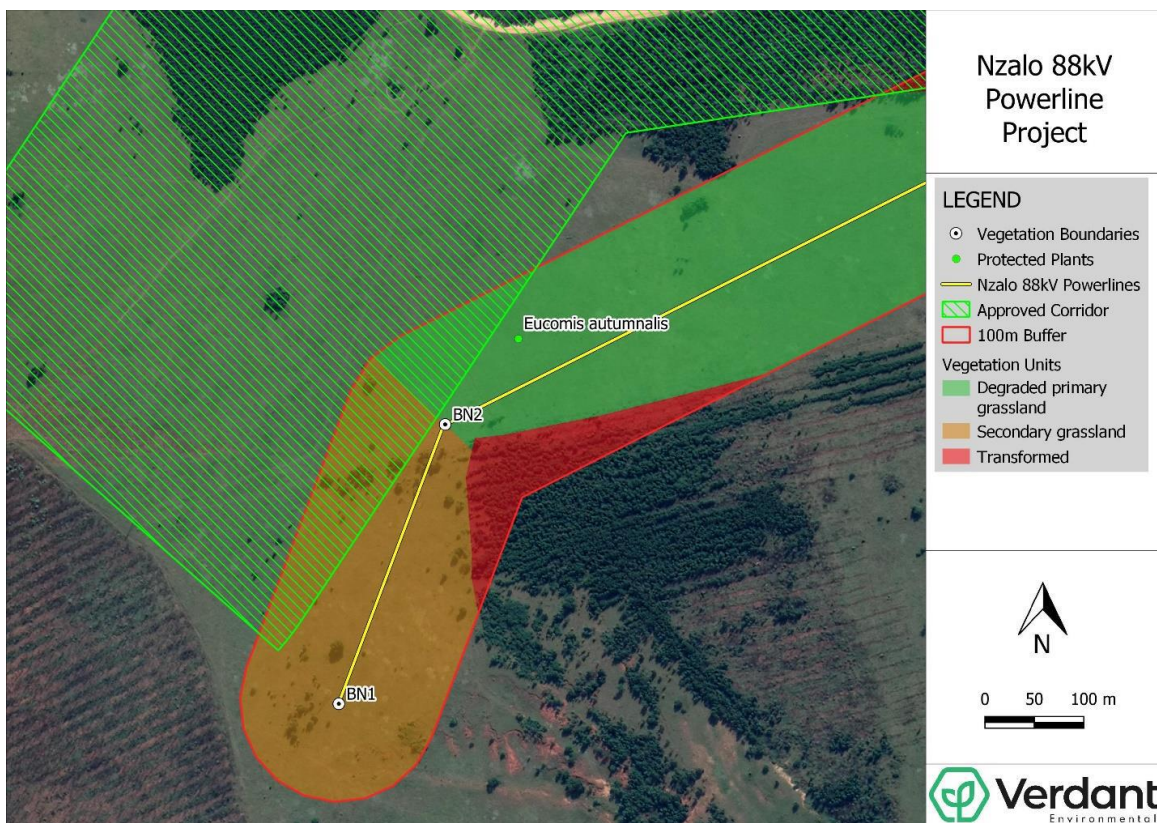


Figure 5.8b: Zoomed in map of the location of threatened and protected species encountered along the southern section of the Normandie-Nzalo alignment.

Red Listed Species: *Merwillia plumbea* (Near Threatened) at NNZ2 to NNZ3. Numbers have been much reduced by medicinal harvesting, but it is still widespread in eastern South Africa and in rocky places and cliff edges, locally common. The small number of plants (< 10 on and near small rock outcrops can be relocated, and because bulbs, likely with a high degree of success).

Orange Category Species: These species are not in higher threat categories such as Critically Endangered, Endangered or Vulnerable. They are in the broad category of Least Concern, but populations are considered to be Declining. This is mainly because of medicinal collection. There is one such species: *Eucomis autumnalis* at BN2 to BN3. This is mainly on the western part of the Bloedrivier-Nzalo 88kV alignment. Again, the number of plants affected appears to be fewer than 10. Although not seen, there is a good possibility of *Boophone disticha* occurring. This was not seen, but occurs in small numbers in many types of grassland in eastern South Africa. It is likewise declining, due to medicinal over-exploitation.

Protected Species: A number of species at the sites are protected by provincial conservation legislation. If any of these species are at risk of disturbance or destruction as a result of the proposed development, a permit should be obtained from Ezemvelo KZN Wildlife to do so, and they should be relocated outside the route where they will not be affected. These relocations should occur in similar habitat and under supervision of a horticulturist. They will also need initial maintenance, particularly watering. Relocation should not occur in the winter months, when in any event some of these plants have a below-ground presence only and will not be found. This includes the :

- *Aloe spectabilis* (one rocky outcrop along the Normandie-Nzalo and Bloedrivier-Nzalo alignments)
- *Eucomis autumnalis* (one rocky outcrop along the Normandie-Nzalo) and the western part of the Bloedrivier-Nzalo alignments), photographed above;
- *Ledebourea ovatifolia* (small number seen in proximity to the Normandie-Nzalo 88kV alignment);
- *Ledebourea marginata* (a small number seen < 10 in proximity to the Normandie-Nzalo 88kV alignment);
- *Ledebouria zebrina* (approximately 20 parts seen, northern part of the Normandie-Nzalo and Bloedrivier-Nzalo 88kV alignments);
- *Merwillia plumbea* (< 5 plants seen, northern part of the Normandie-Nzalo 88kV alignment), photographed above.
- *Aristea torulosa* (northern part of the Normandie-Nzalo 88kV alignment).
- One orchid, *Habenaria clavata*, was seen on a very occasional basis in the western part of the Normandie-Nzalo 88kV line. This is not a rare species.

Most orchids die back by autumn and it is consider there are very likely others not seen at the study sites due to the lateness of the season. Many bulbs are no longer visible by the end of the summer, and I expect there were some that were not seen due to the time of survey.

5.3.2 Fauna

Site Characteristics and Habitat Description: The study area falls within the Grassland Biome4. The sites are largely flat, with moderately sloping topography at the northern end of the alignments. The habitat in the study area is largely homogenous, dominated by degraded grassland. Evidence suggests that the site has been

overgrazed and portions of the site cultivated in the past. The majority of the site is dominated by *Aristida junciformis*. The presence of certain grass species, such as *Imperata cylindrica*, indicates that portions of the site remain damp for large parts of the year. In terms of terrestrial fauna, the main habitat units identified can be described as follows and are presented in **Figure 5.9**:

- **Degraded grassland:** The majority of the study area is covered by degraded grassland. There is evidence that grassland areas at the site have been overgrazed, resulting in a poor diversity of grass species, thus reducing the potential of unit to provide habitat to faunal species.
- **Moderate grassland:** Grassland that, whilst not in pristine condition, is not severely degraded and still possesses some grass species of reasonable grazing value.
- **Transformed land:** Portions of the site being utilised for agriculture and currently under crop. Additionally, two roads traverse the site.
- **Rocky outcrop:** Small area dominated by large rocks.
- **Riparian vegetation:** The proposed alignments cross a river at various points, thus crossing a small portion of riparian vegetation.
- **Plantations:** A small area of exotic tree plantation.



Figure 5.9: Habitat units present in the Bloedrivier-Nzalo 88kV Line and Normandie-Nzalo 88kV Line sites.

Mammals: Of the 84 terrestrial mammal species known to occur in the region, 21 are Red List species - two are endangered, nine are Near Threatened and ten are Vulnerable. None of these species, nor any evidence of these, were noted during the site visit.

Reptiles: According to this dataset, a total of 19 reptile species occur in the region (Appendix E2). This is, however, unlikely to be the complete suite of reptiles likely to be present in the region. No reptile species were

observed onsite, and few suitable microhabitats, namely rocks, trees and logs were present. None of the species recorded in the region are Red List species.

Amphibians: A total of 9 amphibian species have been recorded in the region, all of which are classified as Least Concern (Appendix E2). It must, however, be noted that amphibians appear to be largely under-studied in the area and it is thus unlikely that the full suite of amphibians likely to be present at the site are represented. Suitable aquatic habitat, namely a river, is present onsite. However, these are confined to small portions of the study area and it is likely amphibians would be largely restricted to these areas.

Invertebrate Diversity: Although an extensive invertebrate study was not undertaken at the site, it was noted that there was a reasonable suite of invertebrates present onsite. Most invertebrates observed onsite were Orthoptera, although a variety of Lepidoptera species were also observed. No species of Diplopoda were observed and little habitat, namely logs and rocks was available for such species.

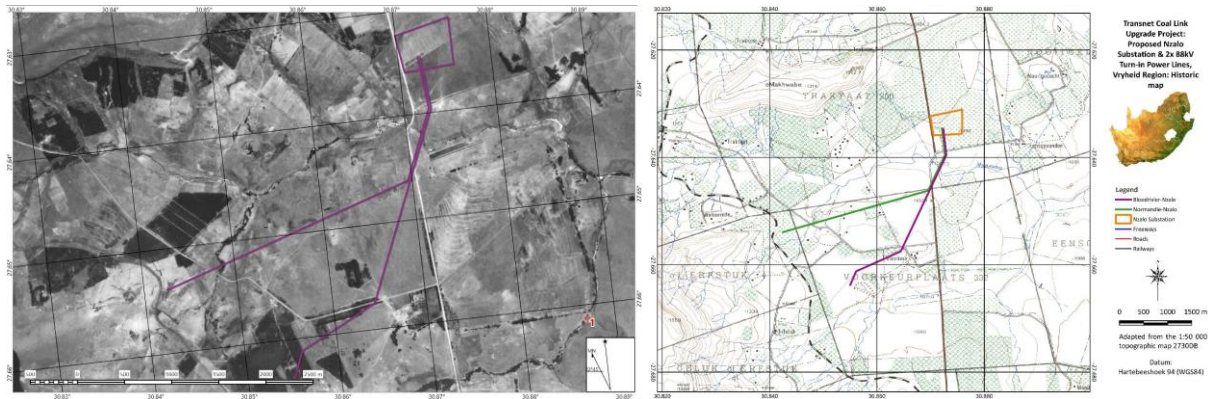
5.3.3 Avifauna

The study site is not located within, or in close proximity to, any IBAs. An avifaunal specialist study conducted in the study area in 2019 indicated that a total of 265 bird species have been recorded within the region²⁶. A number of bird species, including Red-throated Wryneck (*Jynx ruficollis*) and Barn Swallow (*Hirundo rustica*) were observed onsite during the site visit. Of the 265 species reportedly occurring within the region, 11 are Red List species. No Red List species were observed onsite at the time of the site visit. Red Listed species reported to be present in the region are presented in **Table 5.3**.

Table 5.3: Likelihood of occurrence of Red List bird species in the Nzalo study area.

Species	Common name	Conservation Status	Occurrence in study area
<i>Lioptilus nigricapillus</i>	Bush Blackap	Vulnerable	Unlikely
<i>Neotis denhami</i>	Denham's Bustard	Vulnerable	Possible
<i>Anthropoides paradiseus</i>	Blue Crane	Near Threatened	Possible
<i>Balearica regulorum</i>	Grey Crowned Crane	Endangered	Possible
<i>Stephanoaetus coronatus</i>	African Crowned Eagle	Vulnerable	Unlikely
<i>Polemaetus bellicosus</i>	Martial Eagle	Endangered	Possible
<i>Aquila verreauxii</i>	Verreaux's Eagle	Vulnerable	Unlikely
<i>Falco biarmicus</i>	Lanner Falcon	Vulnerable	Likely
<i>Geronticus calvus</i>	Southern Bald Ibis	Vulnerable	Possible
<i>Eupodotis senegalensis</i>	White-Bellied Korhaan	Vulnerable	Possible
<i>Sagittarius serpentarius</i>	Secretary bird	Vulnerable	Possible

5.4 Heritage Aspects and Palaeontology of the area



Aerial view of the project area dating to 1961 The project area on the 1973 version of the 1:50 000 topographic map

Figure 5.10: Site specific review

5.4.2 Palaeontological overview of the area

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).

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (*Leptophloem australe*) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remains in the interbedded mudrocks as well as the diamictite itself, while arthropod 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**.

5.5 Visual Characteristics of the area

5.5.1 Topography

The natural topography is considered varied, ranging between undulating hills and mountainous terrain with a couple of prominent hills forming the western and southern perimeter of the study area. A general downward slope exists from the south west towards the north east. Rivers and streams create shallow depressions in the landscape, but deeper cuts are sometimes present along the foothills of the mountains (**Figure 5.11**).

The topographic variation consists of fairly dramatic elevation changes which contribute to pleasant panoramic views. The hills and the undulating low laying landscape are largely in a natural condition and supports a high scenic quality, although not unique to the region.

The powerlines will be located on a low laying area between the hills. According to the viewshed analysis (**Figure 5.12**), the hills are very effective in containing the Zone of Visual Influence by blocking it on the northern, western and southern side. The topography is more open towards the east. The topography is expected to provide a medium to high screening potential.

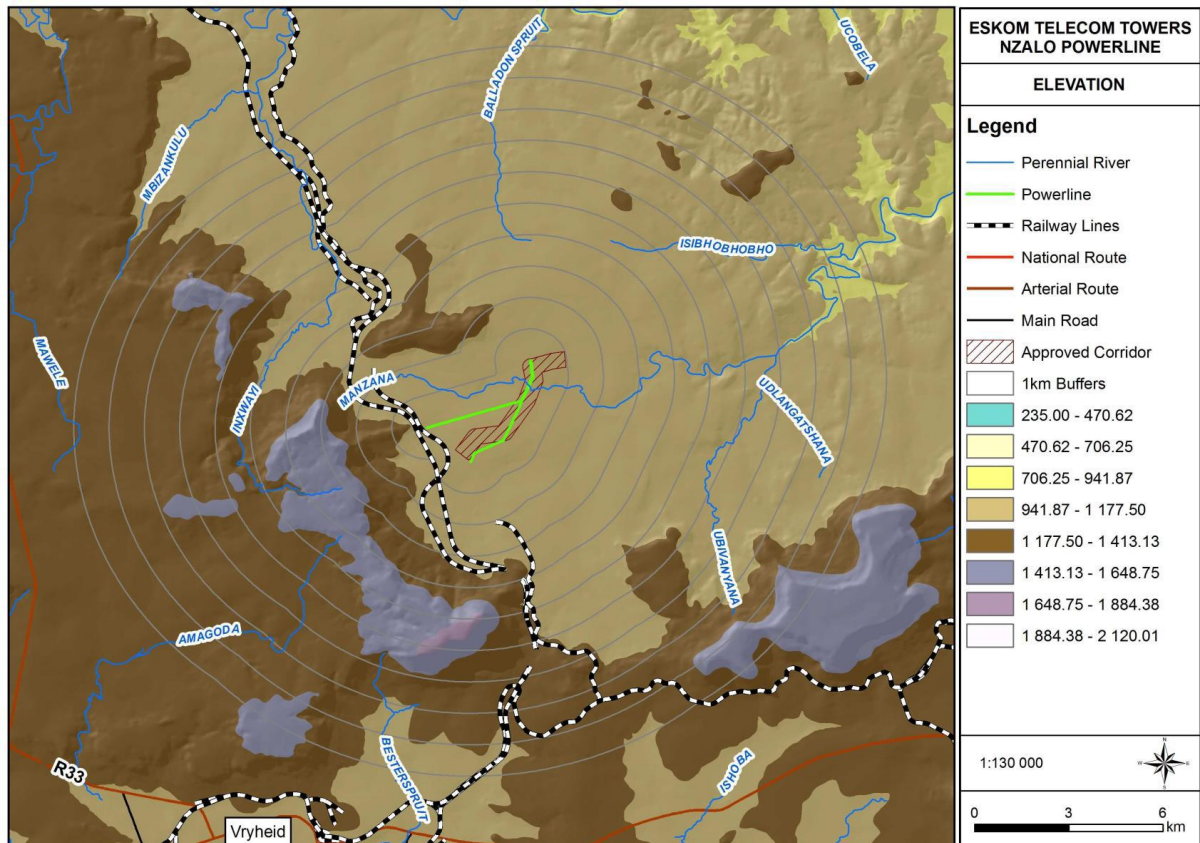


Figure 5.11: Regional elevation map

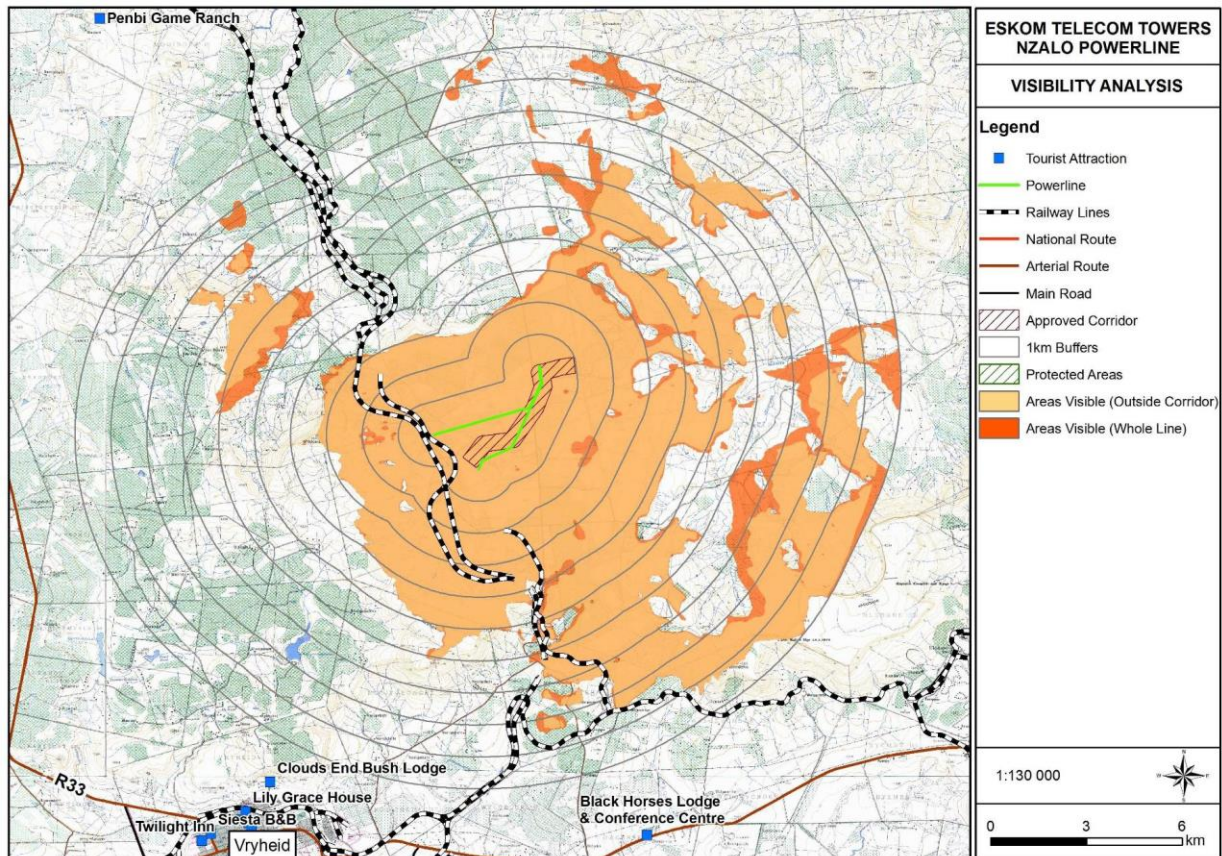


Figure 5.12: Cumulative viewshed map

5.5.2 Land use and Landcover

The study area falls within the Highveld Alluvial vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2012)) which consists mostly of grassland species. Small trees and shrubs are mostly concentrated along streams, rivers and mountain fissures. A reasonably high biodiversity is often associated with the grassland vegetation types if it is in a pristine or undisturbed condition.

The study area is located in a rural farming area north of the town of Vryheid. Forestry is noticeable in fragmented plantations, but the majority of the study area consists of the natural grassland. Cattle farming and small-scale crop cultivation are amongst the general land uses.

The P34-4 alternative road to Paulpietersburg is a tarred road passing through the study area. It mostly serves the farming communities between Vryheid and Paulpietersburg. A railway line loosely follows the foot of the mountains, weaving across the study area in a north-south direction. The small farming community of Zungwini is present near the proposed powerline route and consists of numerous farmsteads scattered along the dirt road. The rural community of Doornkloof are also present approximately 6km to the east of the proposed powerline near the Manzana River.

Two existing powerlines traverse the study area. A 400kV transmission line runs parallel to the P34-4 road, approximately 1,3km to the east. An 88kV powerline also follows the P34-4 along its western side, but changes course in a north westerly direction where it passes through the mountains near the planned connection point with the proposed Nzalo powerlines. The proposed powerlines will connect to this particular 88kV line at two different locations.

The study area is considered rural, with the natural grassland vegetation draped over the undulating landscape. The mountains provide elevational definition to the landscape and are features of interest, contributing to a pleasant scenic quality. In general, the landscape provides picturesque views that are supported by topographic variation and large expanses of natural grassland. The character of the study area is also defined by existing transport networks such as roads and railways, as well as existing powerline infrastructure.

5.5.3 Sense of Place

The sense of place is largely dictated by the predominantly agricultural land use and natural grassland vegetation covering the hills and undulating plains. The mountains provide a picturesque backdrop to an otherwise undulating landscape. The farmsteads enforce the rural character of the study area. The sense of place is peaceful and unpretentious, and harmonises with the lazy weaving of the railway line along the contour. A natural value and pleasing scenic quality can be attributed to the study area.

5.5.4 Viewshed Analysis

Several views were assessed during the site investigation as illustrated in **Figure 5.12**. In addition, visibility mapping through a Geographical Information System (GIS) software is also done to determine a preliminary Zone of Visual Influence (ZVI). The mapping indicates the extent of the potential ZVI based on the topography alone, thereby not considering the screening effect of vegetation or other structures (**Figure 5.11**).

The conclusion is that the study area's topography provides a high degree of screening and contains most of the powerlines' visibility between the mountains. Towards the east, the topography is more open, and visibility extends further into this area, although fragmented. However, the landcover, for example plantations and other natural or anthropogenic features, do provide an additional screening capacity in specific locations. This has the potential to raise the degree of screening in some localised areas.

5.5.5 Study Area Photographic Record

As shown in **Figure 5.12**

- Panoramic view (1): This photo is taken from the T-Junction at the dirt road (P-300) with the P34-4, in an eastern direction. It illustrates the open landscape to the east of the proposed Nzalo powerlines. The proposed powerlines will cross the P34-4 to the north of this viewpoint to join a future proposed substation;
- Panoramic view (2): This photo represents a view from the dirt road overlooking the study area. Note the mountains on either side which blocks the visibility of the power lines to the north, west and south. The existing 88kV powerline passes left of the road;
- Panoramic view (3): This panoramic view is taken at the site where the two powerlines will connect with the future substation. It represents the view from the P34-4 looking into a south western direction.



Figure 5.12: Panoramic view (1)



Figure 5.12: Panoramic view (2)



Figure 5.12: Panoramic view (3)

5.6 Social Characteristics of the Study Area and Surrounds

The purpose of this section is to provide an overview of the current socio-economic situation within the proposed project area. This section will provide a strategic understanding of the socio-economic profile of the study area, in order to develop a better understanding of the socio-economic performance as a background to the development of the project. The data presented in this section has been largely derived from the most recent (2011) Census, as well as the municipalities IDP.

5.6.1 Abaqulusi Local Municipality

General

Abaqulusi Municipality is approximately 4 185 km² in extent with Vryheid being the main hub of the Municipality. Abaqulusi is made up of the following main areas: Vryheid, Louwsburg, Hlobane, Coronation, eMondlo, Bhokuzulu, Swart Mfolozi, Enyathi, etc., and consists of 22 wards and 436 rural settlements/villages. The Municipality is traversed by the regional routes, R 33 the north, the R 69 to the east and the R 34 to the west and south-east. These regional routes connect the surrounding municipalities to the Abaqulusi Municipality. The R 33 creates a linkage to Paulpietersburg, while the R 69 connects to Pongola and the R 34 connects to Dundee to the west and Request to the south.

Demographics:

Figure 5.13 depicts the population distribution per ward. The highest number of people is found in ward 13, which accounts for 6.75% of the municipality. This is followed by Wards 22, 12 and 21 representing 6.08%, 6.02% and 5.97% of the population, respectively. According to Stats SA 2011 Census, over the last year, the Municipality has seen a 1% population growth. The expected population growth and its location, presents the area with a unique set of challenges including addressing the need of the growing population in terms of labour tenants, land restitution and land redistribution. In essence, it may lead to the growth of settlements on agricultural land, which could result negatively on agricultural production.

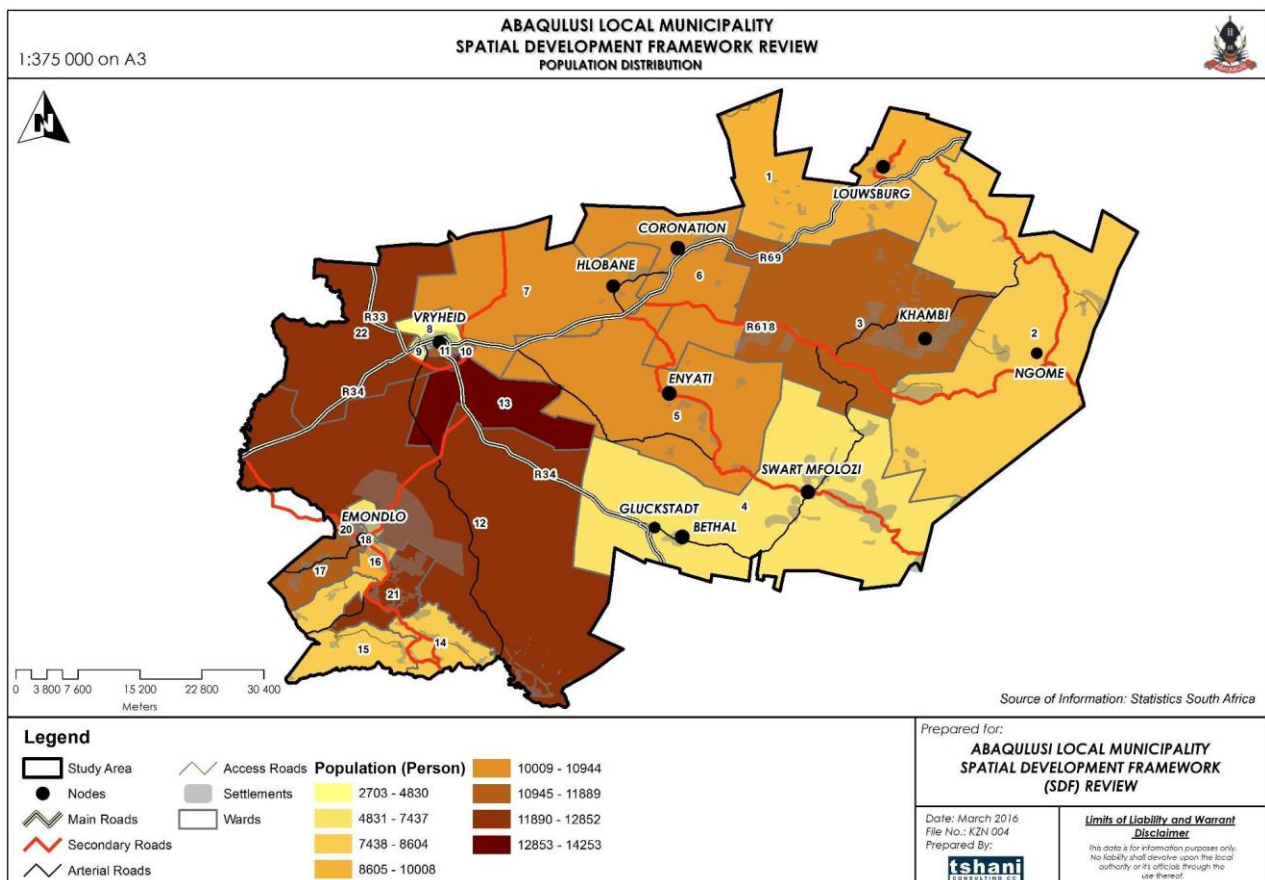


Figure 5.13: Abaqulusi Local Municipality Population

Socio-Economic Profile

The Zululand District has three main types of land use and settlements: traditional authority areas, commercial farms and towns/urban areas. The overall income level within the District is low, as it is very difficult for the various municipalities to build a proper tax base, which can be utilised for the provision and maintenance of services. There is a high social grant dependency and only a small portion of the population qualifies for payment of taxes, which leaves a huge burden on the current taxpayers to fund the grants as well as the maintenance of services. The region will not be able to implement or maintain any services with external funding. Therefore, it is essential that the district implement initiatives to grow its tax base through the successful implementation of economic development initiatives.

The biggest employment sector in the District Municipality is the Community, Social and Personnel sector that relates to the high dependency on government services provided to the communities. Thereafter, it's Agriculture, hunting, forestry and fishing sector, which depicts the high rural nature. The wholesale and retail trade industries followed by the private households depicted the dependency of the rural areas for in the domestic environment. The remaining sectors are aimed that the smaller urban areas.

Economic Context

The region is somewhat isolated from the national economy due to its location, its relation to transportation routes and its distance from the major centres of Durban, Johannesburg, and Richards Bay. Moreover, raw materials required for manufacturing purposes are scarce and raw materials found with the District relate directly to coal and the mining thereof. Agricultural activities including maize, beef, timber and sugar production are prevalent in the District. There is no further beneficiation of the products as the raw materials are transported to economic nodes in KZN, Gauteng, etc.

Abaqulusi is the biggest contributor to the District economy, accounting for 35.7% of the total Zululand District GVA. The Municipality's economic structure is more diverse than other local municipalities. Wholesale and retail trade was the biggest contributor to the municipal GVA in 2010, which was followed by manufacturing, finance, and general government, thereafter, by agriculture and transport. Currently, mining and quarrying is the smallest economic sector in the municipality.

Source: Abaqulusi Final Spatial Development Framework 2020-2021

5.6.2 eDumbe Local Municipality

Demographics:

The population of eDumbe Municipality was recorded at 89 614 people in 2016 compared to a total of 82 053 in 2011. This is evidence of an increase of 7 561 people between 2011 and 2016. This increase can be attributed by a number of factors such as immigration by residents moving from other neighbouring areas to eDumbe in search for better opportunities and standard of living, or/and an increased housing development. The age structure of eDumbe on the population pyramid (see figure 9) reveals a children population profile with 41.3% of the population under the age of 14 years of age and 52.2% being of working age, and with only a 6.2% of the elderly population. eDumbe population consists of more females than males, the females account for 53,1% of the population and male population only account for about 46,9%. This is assumed to be related to males who migrate to seek employment opportunities outside the municipal boundaries, which has translated to 52.1% of the households being female-headed.

Employment

The level of unemployment is estimated at approximately 37, 7%. Below a moderate percentage, a proportion of 45.4 % of this youthful population is unemployed. Approximately 18, 3% of them have no schooling and only 22.1 % have reached Matric level, yet 4% have higher education, i.e. 20+ of age. The total number of households in eDumbe is 16 138, and 8 206 are agricultural in practise. 74% of the dwellings are formal, 62.6% are owned/paid off, yet only 5.5 % have flush toilet connected to sewerage, and 13.8% are piped with water inside dwelling. 62.8% DUs have electricity for lightning.

Economy

The Gross Domestic Product (GDP) of eDumbe Municipal Area is estimated R 1 261 941 000 which accounts to 10% of the Zululand District GDP. The GDP of both eDumbe and Zululand District are quite small when a comparison is made with the rest of the areas within KwaZulu-Natal. In fact, the provincial GDP is estimated at approximately R 420 647 000 000 while Zululand District is said to account for only 3% (R 12 619 410 000) of that GDP. This implies that the size of the local economy is very small.

The agricultural sector is the major employer and eDumbe's economy is far more heavily reliant on agriculture than both Zululand and KZN. This is the major economic activity in the study area, due to availability of good quality agricultural land, however the heavy reliance on agriculture represents a relatively underdeveloped economy that requires further diversification and development of the secondary sector.

Infrastructure

With regards to water and sanitation provision in eDumbe area, the Municipality is playing a coordination role whilst the Zululand District Municipality is a Water Service Authority. In striving to provide water and sanitation to the municipalities effective and adequately, Zululand District Municipality has developed the Waters Services Development Plan (WSDP) which is reviewed annually.

Provision of electricity within the eDumbe municipal area is sourced from 6 substations. Service delivery in eDumbe municipality remains a challenge and levels of delivery differ greatly by ward with many households especially in the townships and tribal areas having low levels of access to electricity. Some rural areas are still dependent on wood as a source of energy. Eskom is playing a major role in assisting the local community with regards to rural electrification. The main reason for such areas no to be electrified is the dispersed nature of settlements, which makes provision economically unviable. The Municipality and Eskom have a distribution license issued by the National Electricity Regulator of South Africa (NERSA).

20,7% of households have access to decent refuse removal, 65,1% use their own yards to dispose refuse. An external service provider has been contracted by the Municipality to collect refuse on a daily basis from the Paulpietersburg CBD, taxi rank, Dumbe Township and Bilanyoni twice a week respectively.

The municipality's IDP indicates the generally low levels of education of residents over 20 years old that exist in eDumbe. Seventeen percent of the population has no schooling at all; 5% have a matric and only 1.5% possesses any sort of higher education. These averages are generally in line or tend to be slightly better than for the district municipality; however, they lag behind provincial averages. eDumbe LM currently has 123 schools, 30 of these are creches (both formal and informal), 72 primary schools and 17 secondary schools, and 13 Combined school. The 2018/19 IDP has proposed 39 Early Childhood Development Centres (ECD).

Source: 2017-2040 edumbe Spatial Development Framework

6 DESCRIPTION OF POTENTIAL IMPACTS AND ISSUES

The activities that are associated with the construction, maintenance and operation of the proposed power lines, which could potentially have an impact on the environment, are also highlighted in this section. In addition, the Department of Environmental Affairs guide on assessing cumulative effects³ 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.

Existing Eskom access roads (for the distribution lines) are said to have already created erosion (e.g. animals walking along these tracks creating permanent unwanted paths). At this stage a limited impact on existing infrastructure and services are anticipated during the construction phase. Existing road crossings are limited and are expected to successfully respond to project management and mitigation measures.

6.1 Aquatic and Wetland impacts

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

Results of the Wetlands Assessment

The baseline assessment focused on the watercourses units that will be crossed by and/or within 500m of the powerline alignments. The extent (infield delineation), classification, habitat characteristics, present ecological state (PES) and ecological importance and sensitivity (EIS) of the watercourse units are discussed in this section of the report. The following watercourse units were identified near the Nzalo powerline site.

- NZA R01 – Lower foothills river (not affected by the proposed deviation)
- NZA R02 – Upper foothills river (**impacted by the proposed deviation**)

The location and extent of the delineated watercourses within 500m of the Nzalo powerline alignments are shown in **Figure 6.1**. Two (2) riverine units (NZA R01 and NZA R02) were delineated and assessed within 500m of the proposed Nzalo powerlines alignments. The biophysical characteristics of these two units are described in Tables 6 and 7 of Appendix E1. **But only unit NZA R02 – Upper foothills river will be directly impacted by the proposed deviation as shown in Figure 6.**

³ DEAT (2004) *Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.*

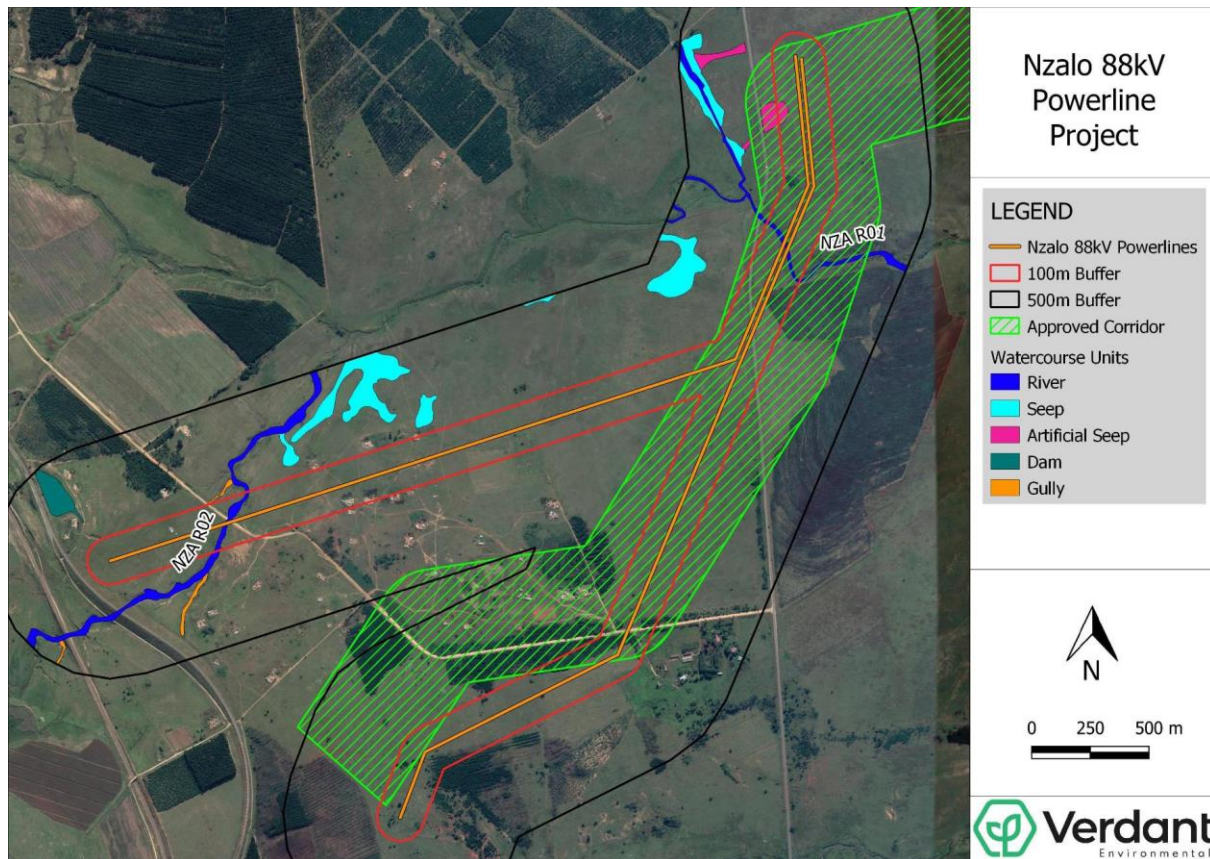


Figure 6.1: Location and extent of the river and wetland units delineated within 500m of the powerline alignments.

Present Ecological State (PES) Assessment

Units **NZA R01** was assessed as being in a **'Largely Natural'** state. The most prominent impact to this unit is likely to be reduced catchment water inputs and increased sediment inputs because of forestry in the units' catchments. The unit has also experienced localised bed and bank erosion in the vicinity of the bridge that crosses the assessed reach of this river unit. **NZA R02** was assessed as being in a **'Fair' state**. This unit has experienced notable bed and bank erosion associated with historic agriculture which was focused on flat land next to the river unit.

Ecological Importance & Sensitivity (EIS) Assessment

Units **NZA R01** and **NZA R02** were both assessed as being of **'Moderate' EIS**. These ratings are an outcome of

- (i) the moderate importance of the biota sampled as part of the SASS5 assessment completed for **NZA R01**, (moderate diversity and abundance of intolerant species),
- (ii) the moderate importance of aquatic habitat of **NZA R01** and **R02** as a source of refuge for freshwater biota, especially given the perennial flows of **R01**, and
- (iii) the aquatic conservation importance of the study area (sub-quaternary catchment associated with the study area has been highlighted as a Fish Support Area)

Summary of impacts assessed

Direct:

- Planned direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by for pylon of access road establishment within freshwater ecosystems (location of pylons still to be confirmed).

- Accidental direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by heavy machinery during construction i.e. poorly planned access roads.
- Wetland fauna fatalities.

Indirect hydrological and geomorphological impacts:

- Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and land cover disturbance during construction.

Water quality impacts:

- Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.

Impact Significance Assessment

Impacts to Water Resource Quality and Quantity:

The proposed powerline alignments effectively avoid wetlands and crosses one river units only. The authors are thus of the opinion that the proposed alignments are acceptable from an environmental planning perspective. However, the construction of powerlines could have significant freshwater ecosystem impacts if the pylons are constructed within or near the rivers and wetlands. The most significant impacts are the potential direct impacts during the three phases of the project and the indirect erosion and sedimentation impacts during the construction and decommissioning phase. Even if the pylons are planned to avoid the wetland and riparian areas, the establishment of access roads during all phases of the project could have unintended impacts to watercourses if poorly planned. Nevertheless, if all pylons avoid watercourses and access and service roads follow the alignments and use existing river crossings, the significance of these impacts will be moderately-low significance under a poor mitigation scenario. With the implementation of the mitigation measures recommended in Section 7 of Appendix E1, all the impacts can be reduced to **low significance**.

Impacts to Freshwater Ecosystem Conservation

Like for the impacts to water resources, the most significant impacts are the potential direct impacts during the three phases of the project and the indirect erosion and sedimentation impacts during the construction and decommissioning phase. If all pylons avoid watercourses and access and service roads follow the alignments and use existing river crossings, the significance of these impacts will be moderately-low significance under a poor mitigation scenario. With the implementation of the mitigation measures in Section 7 of Appendix E1, all the impacts can be reduced to **low significance**.

Impacts to Freshwater Species Conservation

The terrestrial biodiversity impact assessment for the project (Verdant, 2021) indicates that the following freshwater species may be impacted by the proposed powerline project (**Table 6.1**):

Table 6.1. Summary of the freshwater species that may occur within the study area.

Scientific Name	Common Name	Threat Status
<i>Aonyx capensis</i>	African Clawless Otter	Near Threatened
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	Near Threatened
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable
<i>Balearica regulorum</i>	Grey Crowned Crane	Endangered

The above-listed species may frequent the local wetlands regularly. However, if all pylons avoid watercourses and access and service roads follow the proposed alignments and use existing river crossings, impacts to these species if present will be substantially reduced. For the two bird species, there is a risk that the powerlines could cause fatalities in the long-term considering the large grassland areas and surrounding *hygrophilius* grassland patches. However, considering the present alignment, the direct impacts on such species is still considered of moderately-low significance under a poor mitigation scenario. With the implementation of the mitigation measures recommended Section 7 of Appendix E1, all the impacts can be reduced to **low significance**.

A water use authorization will need to be obtained from the Department of Water and Sanitation for approval of the water use aspects of the proposed activities where lines cross water courses and where pylons are to be placed within the 32m buffer area of wetlands and rivers.

6.2 Risk of impacts on the ecology

6.2.1 Vegetation

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E2 – Terrestrial Impact Assessment Report** for more details).

Results of the Vegetation Study:

A limited amount of good grassland of this type also occurs between points NNZ2 and NNZ3 on the Normandie-Nzalo 88kV line and an even smaller part of the Bloedrivier-Nzalo 88kV line. This comprises only a minority of the traversed grassland habitat, which is otherwise quite degraded to nearly secondary. The grassland species composition is thus measurably altered and the species diversity measurably reduced. Nevertheless, it is also important to note that primary representations of Paulpietersburg Grassland are listed nationally as ‘endangered’ and that large portions of the grassland areas along the route are categorised as CBAs in terms of the KZN Systematic Conservation Plan. For these reasons, the degraded primary grasslands were rated as being of moderately-high EIS. The EIS ratings for the mapped vegetation communities along the alignment are summarised in **Table 6.2** below and shown in **Figure 6.2**.

Table 6.2: EIS ratings for the mapped vegetation communities.

Vegetation Community	EIS Rating
NNZ1 to NNZ2: Secondary grassland	Low
NNZ2 to NNZ3: Degraded primary grassland with dolerite outcrop	Mod-High
BN1 to BN2: Secondary grassland	Low
BN2 to BN3: Degraded primary grassland	Mod-High
BN3 to BN4: Secondary grassland	Low

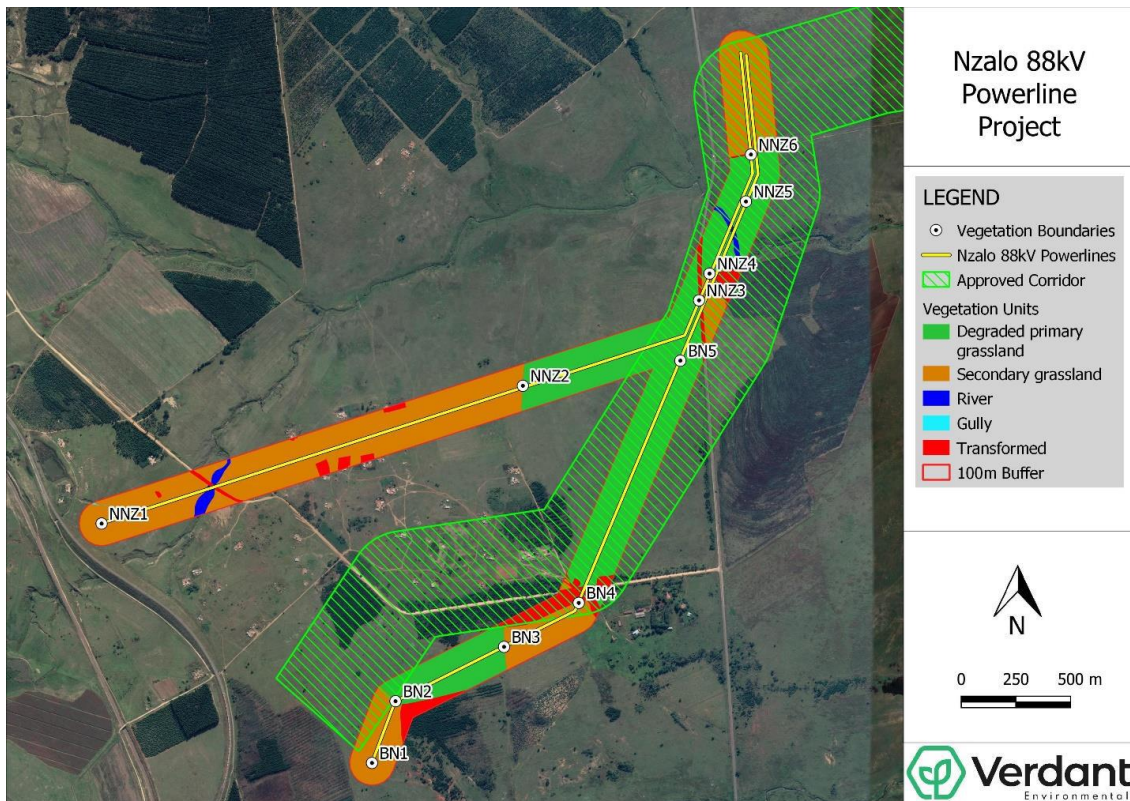


Figure 6.2: EIS map for vegetation occurring within 100m of the powerline alignments.

6.2.2 Fauna

Faunal Habitat Sensitivity:

Based on onsite observations, as well as a desktop analysis, each of the habitat units were assigned to a sensitivity class, based on faunal sensitivity, as summarised in Table 6.3 and presented in **Figure 6.3**.

Table 6.3: Sensitivity ratings for the mapped habitat types.

Habitat Type	EIS Rating
Degraded grassland:	Medium
Moderate grassland:	Medium
Transformed land:	Low
Rocky outcrop:	Medium
Riparian vegetation:	Medium
Plantations	Low

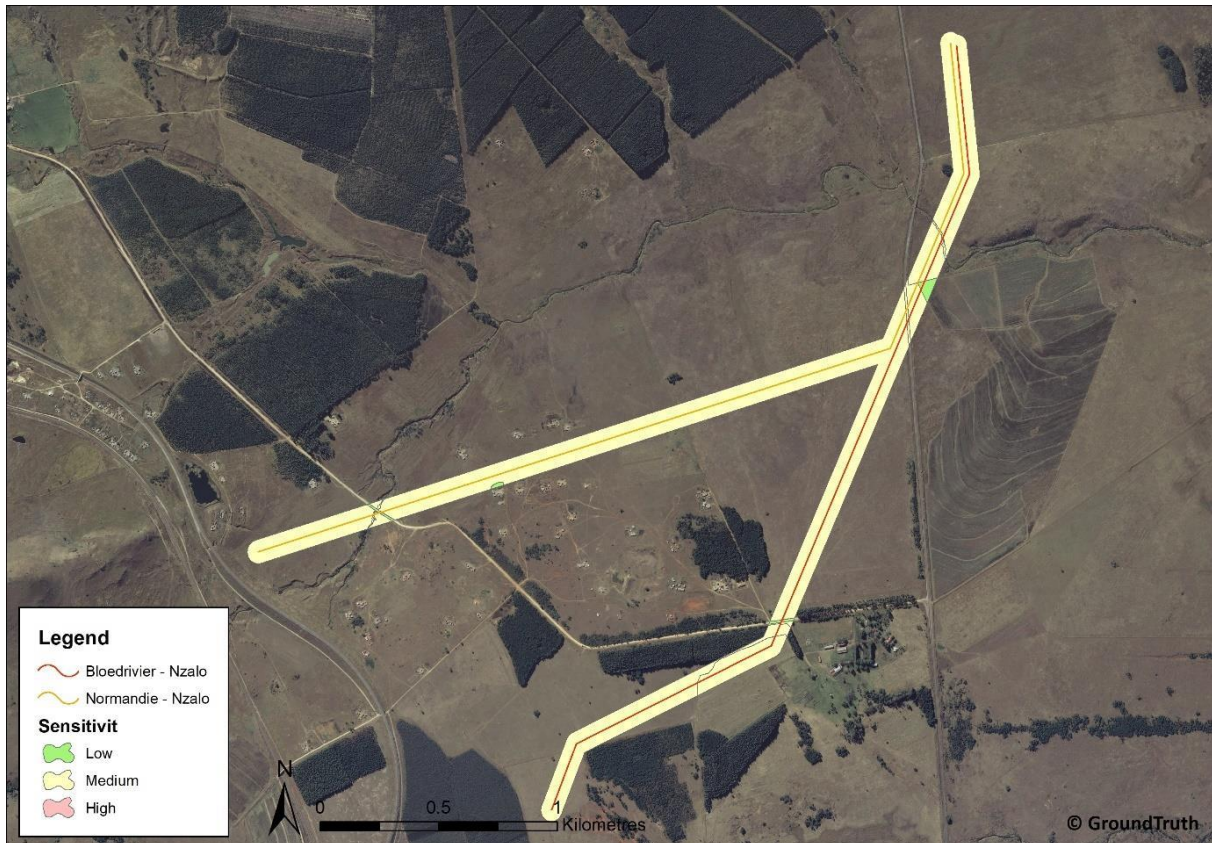


Figure 6.3: Habitat sensitivities, based on terrestrial faunal sensitivity, for the Nzalo study site.

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

- **Direct ecosystem destruction and modification impacts** – This impact refers to the direct physical destruction and/or modification of terrestrial vegetation communities and habitat during the construction and operational phases of the project and includes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.
- **Indirect ecosystem disturbance impacts** – This impact refers to the indirect impacts to the biota and vegetation communities as a result of activities within close proximity that result in the following impacts: (i) alteration of abiotic soil and moisture conditions, (ii) increased rates of erosion and sedimentation, (iii) alteration of the chemical and biological characteristics of soil and water, (iv) increased alien invasive plant invasion, (v) noise pollution, (v) vibrations and (vi) light pollution, and (vii) expanded edge effect.

6.2.3 Avifauna

The likelihood of occurrence assessment for threatened birds concluded that the following birds may periodically frequent the local area that has been known to be killed by powerlines:

- Grey Crowned Crane – Endangered
- Martial Eagle – Endangered
- Denham’s Bustard – Vulnerable
- Lanner Falcon – Vulnerable

- Southern Bald Ibis – Vulnerable
- White-Bellied Korhaan – Vulnerable
- Secretary bird – Vulnerable
- Blue Crane – Near Threatened

The impact summary: Considering the nature of the surrounding habitat and land uses with secondary and degraded primary grassland, agriculture, a few seep wetlands, and low density rural settlements, Grey Crowned Cranes, Denham's Bustards, Secretary birds and Blue Cranes will be most at risk, particularly along flyways between different habitats utilised like the seep wetlands and the agricultural fields. In addition, Martial Eagles are also likely to be at risk considering the treeless landscape where towers could become preferred nesting sites. Nesting on the tower places the Martial Eagle adults and young at much greater risk of collision with the overhead cables than would otherwise be the case (Smallie, 2017). Blue Cranes in particular are highly susceptible to powerline collisions and have a tendency to frequently move in flocks between different agricultural fields and daily flights to and from roosting areas during the early morning and early evening (when light conditions are typically poor making it more difficult for them to observe the overhead lines) (Froneman and van Rooyen, 2015; Jenkins et al. 2010).

Under a realistic poor mitigation scenario where the powerline is established as currently planned and no special bird flight divertors and/or bird friendly pylon / tower designs are implemented, the significance of Impact O1-1 was assessed as **being moderate and generally unacceptable**. This rating was largely driven by the 'surrounding area' extent, 'moderately-high' impact intensity and 'definite' probability of disturbance. The moderately-high intensity is driven by the direct impacts to threatened bird species that inhabit the area and region, most notably the endangered birds – Martial Eagle and Grey Crowned Crane, as well as several birds listed as vulnerable. Small reductions in the local populations of these bird species are predicted in the long-term.

Under a realistic good mitigation scenario where the location of pylons is carefully planned, and measures to minimise bird fatalities are effectively implemented, the significance of Impact C1-2 was assessed as being **moderately-low** and potentially acceptable. The following **factors contributed to the reduced significance** rating:

- The proposed powerline is not located in and adjacent to the preferred habitat of most of the flagged species.
- Most of the proposed powerline does not appear to be located across key or major flyways.
- No wetlands are crossed by the powerline.
- The preventative and mitigation measures listed in Section 7.1.4 of Appendix E2 have proven to be effective in reducing the level of mortality from both electrocution and collisions (Prinsen et al., 2011). Marking seems to be fairly effective, with a recent meta-analysis showing a 65-78% decrease in mortality rates on marked lines (Smallie, 2017 from Barrientos et al. 2011).
- The proposed powerline is relatively short in length.

Considering that potentially significant impacts to threatened avifauna have been flagged as part of this assessment and considering that the faunal assessment was largely desktop based with a once-off rapid site walkover, it is recommended a qualified and experienced ornithologist provide formal comment on the findings of this significance assessment and flag the need for further study.

6.3 Heritage & Cultural Resources Impacts

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E3 & E4** – Heritage & Paleo Impact Assessment Report for more details).

Results of the Heritage Study: During the physical survey, the following sites, features and objects of cultural significance were identified in the project area as shown in **Figure 6.4**.

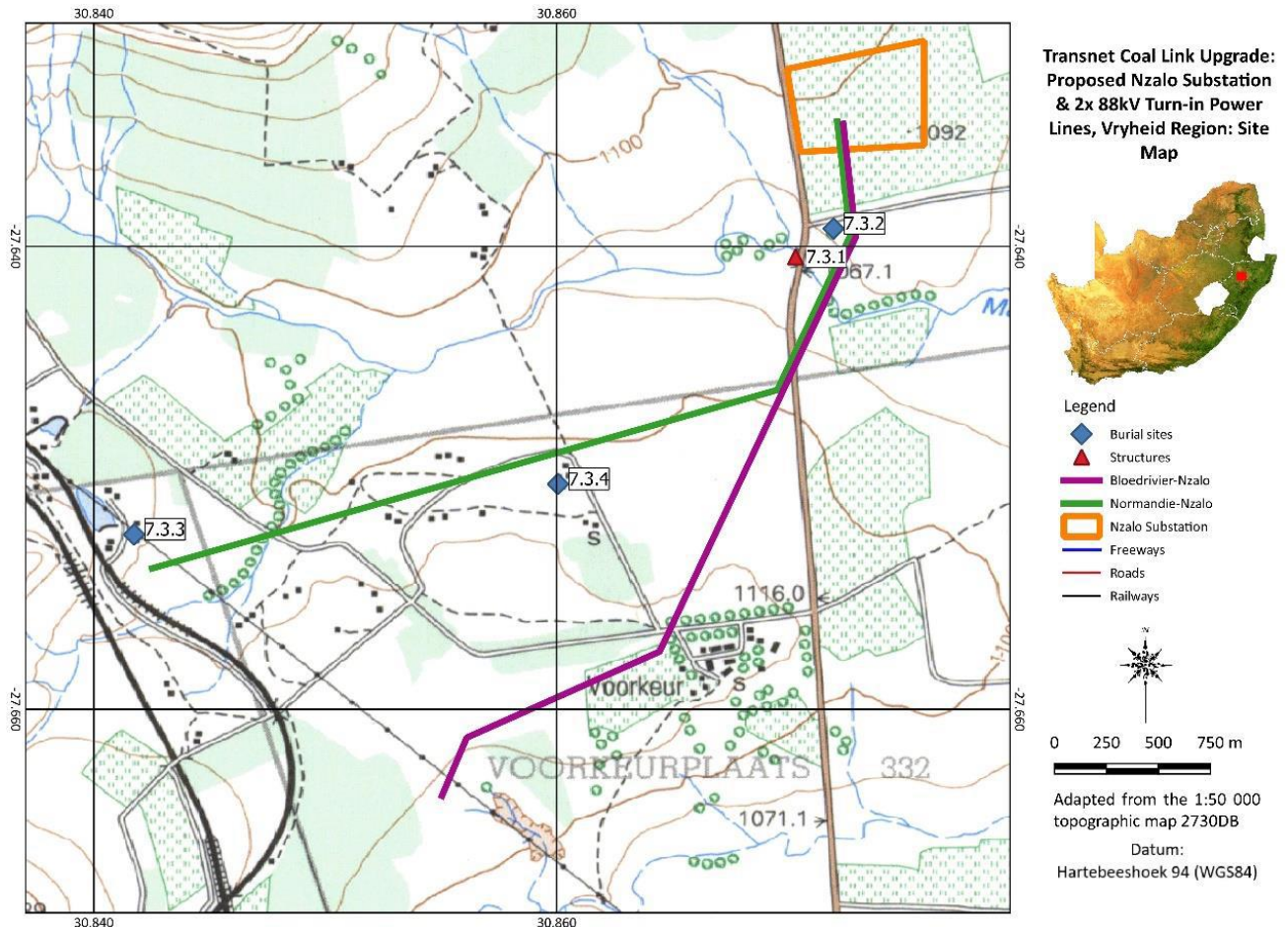


Figure 6.4: Identified features identified in the project area

- Stone Age: No sites, features or objects dating to the Stone Age were identified in the study area.
- Iron Age: No sites, features or objects dating to the Iron Age were identified in the study area.
- Historic period:
 - **Road bridge** on Farm: Traktaat 200, Coordinates: S 27,64045; E 30,87032: Old single lane concrete low water bridge. It originally formed part of the old alignment of the road (number unknown), which was later changed to straighten it out (**Figure 6.5a**)
 - **Burial site 1** on Farm Traktaat 200, Coordinates: S 27,63923; E 30,87196. A single grave marked by a stone cairn. It seems to be very old as it is total overgrown with trees. No other signs of habitation could be detected (**Figure 6.5b**)
 - **Burial site 2** on Farm Voorkeurplaats 332, Coordinates: S 27,65235; E 30,84174. An informal burial site with approximately 12 graves. All are only marked with stone cairns and some have aloes planted on them. These graves belong to the existing and previous homesteads that occur in its immediate vicinity (**Figure 6.5c**).

- **Burial site 3** on Farm: Voorkeurplaat 332, Coordinates: S 27, 65027; E 30,86006. A large area that has been fenced off with wire to create a formal community cemetery. It currently have more than 30 graves, some with headstones. It is possible that some older graves are located outside on the southern side of the fence, but due to the dense grass cover it was difficult to confirm this fact (**Figure 6.5d**).



Figure 6.5a: Different views of the concrete bridge



Figure 6.5b: Views of the burial site1



Figure 6.5c: Views of the burial site2



Figure 6.5d: Views of the burial site 3

Results of the Paleo Study

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

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

Table 6.5: 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 <i>Glossopteris</i> and other plants. Trace fossils. The reptile <i>Mesosaurus</i> 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 6.6: 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
Pietermaritzburg 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 m².

Paul-Pietersburg tower – Vryheid Formation, Dolerite.

Vryheid north – Dolerite, **Pietermaritzburg Formation**.

Louwsburg tower – Dolerite, Vryheid Formation.

Vryheid south – Vryheid Formation.

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 (AMAFPA 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.

6.4 Visual Impact

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 classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. The concentration and distribution of residents are few and sparse, respectively. Viewer incidence is considered low as only a relatively small number of residents are within the ZMVE. Residents from the Doornkloof rural settlement are approximately 6km from the powerline. Their exposure to the potential visual impacts will be significantly reduced due to their distance from the source; therefore their **sensitivity will be low**.

Motorists are considered the least sensitive group of observers due to the speed at which they travel and their brief exposure to impacts. This group is mostly limited to road users on the P34-4 and gravel road network branching off from the tar road. Intermittent views of the proposed powerlines are expected as motorists travel through the study area. The two powerlines will cross the P34-4 before reaching the future substation site. At this point motorists will be more aware of the presence of the powerlines, although only for a **short duration**.

Sensitivity of the Landscape Character:

The study area is considered to have a **medium degree of VAC**. It can be conclusively determined that the visibility will be confined to a distance of 2-3 km to the north and west as a result of the topographical screening. Towards the south and east, visibility can extend to 10km. However, empirical research has indicated that powerlines viewed against a mottled background, for example a mountain with varying shades of colour, is often difficult to distinguish as it blends into the background. This phenomenon will be at play when viewing the powerlines from the east, thereby reducing the ZVI.

A low degree of inter-visibility between adjacent landscapes are expected due to the topographical screening on the north, west and south periphery. This is also confirmed via the viewshed analysis.

Electrical infrastructure are familiar objects in the South African landscape as well as in the study area. The study area features existing powerline infrastructure as well as a railway line which increases the project's compatibility with the landscape character.

The landscape character sensitivity is considered medium and is credited to the generally high scenic quality of the study area, high value landscape attributes for example the mountain and associated natural features. The ZVI of the proposed powerline is expected to be confined within 2-4km due to the topographical screening, and the distance factor which also reduces visibility. The existing electrical network has impacted on the natural landscape character and therefore reduces its sensitivity towards projects of a similar nature.

6.5 Agricultural Potential Impact

- **Probability of impact:** The various site areas are vacant and not utilized for agricultural production with major parts of the sites having low to medium agricultural potential
- **Severity of impact:** There are no major agricultural activities at the sites except for patches of grazing land and homesteads hence the impact will be low
- **Significance of impact:** Mainly due to low agricultural potential of areas. The soil characteristics (tower areas) also confirms the land portion is currently not suitable for commercial agriculture

The site areas are not of commercial agriculture value. The project requires about 300m footprint per project site which will not have any major significant impact on land availability for agricultural production in the future. The sites are vacant lands where there is no major agricultural production except for pockets of grazing land and scattered forests. Areas where there are sensitive environments such as wetlands, adherence to the required water use legislation must be carried out in obtaining the required licenses.

6.6 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 Daily Living
- Impact on Sense of Place
- Safety and Security Related Impacts

6.7 Impacts on Roads and Traffic

An increase in traffic can be expected during the construction phase. The movement of machinery and vehicles will constitute an additional source of noise to the study area. However, this will be limited to the period of construction and mitigation can involve the use of equipment fitted with noise abatement technology (where possible) and the restriction of construction to certain days and times.

Considering the size and extent of the study area as well as details of the exact tower positions are still unknown, it is difficult to estimate exactly which roads will be utilised for the transport and consequently deliver equipment to the site from various centres. It was therefore decided to firstly assess the access roads outside the study area for importing components and consequently site access roads within the study area being utilised during construction.

Importing Components: Equipment required for construction of the power line will consist of three main categories, all transported from different locations. The categories are the foundations (concrete and reinforcing), the structure and hardware (steel) as well as cables for the stringing of the conductor. It is accepted that the foundation material will be imported locally, with the steel and strings imported from other provinces. The construction process and associated equipment and material required are shown in **Figure 6.6**.

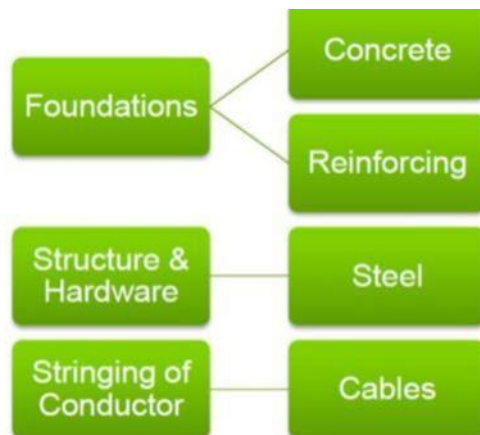


Figure 6.6: Construction transportation process

Site Access Roads: Where possible, existing access roads and tracks will be used to gain access to construction sites and the servitude. Where no access roads/tracks exist, the access points and roads will be negotiated with the relevant landowner, and will be established during the construction phase. Access roads will be constructed up to a width 4m.

Summary of Traffic impacts: The general load will comprise building materials such as concrete and reinforcement, structural steel, and cables for the stringing of the conductor. The proposed project will only have limited increase (i.e. construction vehicles for delivery of materials and clearing/ excavation) in traffic during the construction phase; therefore a Traffic impact assessment is not required and has not been assessed further within this report.

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

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

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on human perceptions. It is the visual specialist's aim to utilise as much quantitative data and scientific research as possible, to substantiate professional judgement and to motivate subjective opinions
- Although all watercourses occurring within 500m of the proposed activities were mapped at a desktop level, field investigations were confined to only those rivers to be impacted by the project activities. For the purpose of this assessment this was considered all watercourses occurring within 100m of the powerline alignments
- The mapping and classification of the watercourse units outside of the study area but occurring within a 500m radius of activities should be considered preliminary and coarse in resolution. These units were not verified in the field.

7 ASSESSMENT OF POTENTIAL IMPACTS

7.1 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).

7.2 Impact Assessment

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

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

7.2.1 Aquatic and Wetland Impact Assessment

The table 7.1 below list the activities that could impact on the wetland as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.1: Water Resources Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
Planned direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by for pylon of access road establishment within freshwater ecosystems (location of pylons still to be confirmed).	<p>Direct Impacts: Impacts to Water Resource Quality and Quantity:</p> <ul style="list-style-type: none"> ○ Impacts to instream aquatic, riparian and/or wetland habitat and vegetation <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p> <p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>	MODERATE-LOW	<ul style="list-style-type: none"> • The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided. • No pylons or towers must be established within or within 50m of any wetlands or riparian areas. • Where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following: <ul style="list-style-type: none"> ○ Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings. ○ The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow. 	LOW
Accidental direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by heavy machinery during construction i.e. poorly planned	<p>Direct Impacts: Impacts to Freshwater Ecosystem Conservation</p> <ul style="list-style-type: none"> ○ Impacts to instream aquatic, riparian and/or wetland habitat and vegetation <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p>	MODERATE-LOW	<ul style="list-style-type: none"> • Outer edge of the delineated wetland and riparian areas occurring within 50m of the proposed powerlines and associated pylons / towers. • The outer edges of the entire construction area for the powerlines. At all watercourse crossings the construction corridor must be as narrow as practically possible and should only include the proposed road footprint and a one-way running track. • Access to and from the project area should be either via existing roads or within the construction servitude. 	LOW

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
access roads.	<p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>		<ul style="list-style-type: none"> • Demarcation of all identified access, haulage and service roads. The alignment and routes for these roads need to be reviewed by the wetland or aquatic ecologist. • All excavated soils and soil stockpiles must be stored / sited outside of the watercourses. • The demarcation work must be signed off by the Environmental Control Officer (ECO) before any work commences. • Demarcations are to remain until construction and rehabilitation is complete. • All areas outside of this demarcated working servitude must be considered no-go areas for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project. • No equipment laydown or storage areas must be located within delineated wetland or riparian habitats. • All areas outside of this demarcated working servitude must be considered no-go areas for the entire construction phase. Any contractor found working within No-Go areas must be fined as per fining schedule/system setup for the project. 	
Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.	<p>Direct Impacts: Impacts to Freshwater Species Conservation;</p> <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p> <p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>	LOW	Same as above	LOW

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
OPERATIONAL PHASE IMPACTS				
<p>Accidental direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by heavy machinery during repair and maintenance i.e. poorly planned access roads.</p> <p>Wetland avi-fauna fatalities.</p>	<p>Direct Impacts: Impacts to Water Resource Quality and Quantity:</p> <ul style="list-style-type: none"> ○ Impacts to instream aquatic, riparian and/or wetland habitat and vegetation <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p> <p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>	MODERATELY-LOW	<ul style="list-style-type: none"> • Maintenance and management <ul style="list-style-type: none"> ○ It is the applicant's responsibility to ensure the proper functioning of all powerline and service road infrastructure that is likely to require regular on-going maintenance. ○ It is important that the location and extent of the wetlands and rivers in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project. ○ The wetland and river areas occurring within the powerline servitude must not be too regularly burnt or cut. ○ In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates • Monitoring <ul style="list-style-type: none"> ○ It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively to identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored: ○ Erosion and/or sedimentation in the wetland / river downslope of pylons. ○ Erosion and/or sedimentation in the wetland / river upstream and downstream of service road crossings and powerline crossings. ○ Presence of alien invasive plants. ○ Powerline bird mortalities at river crossings. 	LOW
<p>Accidental direct impacts to instream aquatic, riparian and/or wetland habitat and vegetation by heavy machinery during repair and maintenance i.e.</p>	<p>Direct Impacts: Impacts to Freshwater Ecosystem Conservation</p> <ul style="list-style-type: none"> ○ Impacts to instream aquatic, riparian and/or wetland habitat and vegetation <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p>	MODERATELY-LOW	<ul style="list-style-type: none"> • Maintenance and management <ul style="list-style-type: none"> ○ It is the applicant's responsibility to ensure the proper functioning of all powerline and service road infrastructure that is likely to require regular on-going maintenance. ○ It is important that the location and extent of the wetlands and rivers in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project. ○ The wetland and river areas occurring within the powerline servitude must not be 	LOW

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>poorly planned access roads.</p> <p>Wetland avi-fauna fatalities.</p>	<p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>		<p>too regularly burnt or cut.</p> <ul style="list-style-type: none"> ○ In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates ● Monitoring <ul style="list-style-type: none"> ○ It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively to identify any environmental issues and impacts that may arise as a result of the operational phase of the project. The following key aspects should be monitored: ○ Erosion and/or sedimentation in the wetland / river downslope of pylons. ○ Erosion and/or sedimentation in the wetland / river upstream and downstream of service road crossings and powerline crossings. ○ Presence of alien invasive plants. <p>Powerline bird mortalities at river crossings.</p>	
<p>Operation of the power lines</p>	<p>Direct Impacts: Impacts to Freshwater Species Conservation;</p> <ul style="list-style-type: none"> ○ For the two bird species, there is a risk that the powerlines could cause fatalities in the long-term considering the large grassland areas and surrounding <i>hygrophilius</i> grassland patches. <p>Indirect Impacts: Erosion and/or sedimentation of instream aquatic, riparian and/or wetland ecosystems due to catchment and/or wetland / riparian zone soil and vegetation clearing and landcover disturbance during construction.</p> <p>Cumulative Impacts: Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p>	<p>MODERATE-LOW</p>	<p>Same as above</p>	<p>LOW</p>

7.2.2 Terrestrial Biodiversity Impact Assessment

The table 7.2 below list the activities that could impact on the Terrestrial Biodiversity as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.2: Terrestrial Biodiversity Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
Soil and vegetation clearing and landcover disturbance during construction for <ul style="list-style-type: none"> • Pylon establishment. • Access road establishment. • Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads Mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. 	<p>Direct Impacts:</p> <p><i>Impacts to terrestrial vegetation communities and habitat:</i></p> <ul style="list-style-type: none"> • Destruction and modification of primary and secondary grassland <hr/> <p>Indirect Impacts:</p> <ul style="list-style-type: none"> • Erosion and/or sedimentation of primary and secondary grassland due to Pollution of primary and secondary grassland <hr/> <p>Cumulative Impacts:</p> <p>Degradation of primary grassland type and less representative grassland for meeting conservation targets.</p>	MEDIUM	<ul style="list-style-type: none"> • The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved. • No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and demarcated using brightly coloured shade cloth: <ul style="list-style-type: none"> ○ Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. ○ The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. ○ The outer edges of the entire construction corridor / right-of-way. • Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> ○ 7.1.1. Powerline Alignments and Pylon Siting ○ 7.1.2. Powerline Access and Service Roads ○ 7.2.1. Powerline Access and Haulage Roads ○ 7.2.3. Demarcation of 'No-Go' areas and construction corridors ○ 7.2.4. Method Statements for working in primary grasslands ○ 7.2.10. General rehabilitation guidelines ○ 7.2.11. Construction phase monitoring measures 	LOW

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>Fauna displacement and/or fatalities during planned direct impacts to primary and secondary grassland for access road establishment.</p> <p>Fauna displacement and/or fatalities as a result of accidental direct impacts to primary and secondary grassland by heavy machinery during construction i.e. poorly planned access roads.</p>	<p>Direct Impacts:</p> <p><i>Impacts to terrestrial biota / species (flora and fauna):</i></p> <ul style="list-style-type: none"> Fauna displacement and/or fatalities during planned direct impacts to primary and secondary grassland for pylon establishment. <p>Indirect Impacts:</p> <ul style="list-style-type: none"> Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of primary and secondary grassland due to soil and vegetation clearing and landcover disturbance during construction. Flora and fauna stress and/or fatalities as a result of pollution of 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. <p>Cumulative Impacts:</p> <p>Negligible cumulative impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed.</p>	<p style="text-align: center;">MODERATELY-LOW</p>	<ul style="list-style-type: none"> The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved. No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. Once the location of the pylons / towers and access / service roads are confirmed, a botanist must visit the footprint sites at the appropriate time of year to identify and map the location of all threatened and protected plants. Once the identity and location of all threatened and protected plants are confirmed, permits to remove and translocate such species must be acquired and a search and rescue plan must be compiled and implemented. This must be undertaken prior to construction commencing. Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and demarcated using brightly coloured shade cloth: <ul style="list-style-type: none"> Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. The outer edges of the entire construction corridor / right-of-way. Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> 7.1.1. Powerline Alignments and Pylon Siting 7.1.2. Powerline Access and Service Roads 7.2.1. Powerline 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 primary grasslands 7.2.8. Prohibitions related to animals 	<p style="text-align: center;">LOW</p>

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>during planned direct impacts to primary and secondary grassland for</p> <ul style="list-style-type: none"> • pylon establishment • Access road • Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads 	<p>Direct Impacts: <i>Impacts to local and regional landscape ecological processes</i></p> <ul style="list-style-type: none"> • Ecosystem fragmentation • Fauna displacement and/or fatalities <hr/> <p>Indirect Impacts:</p> <ul style="list-style-type: none"> • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of grassland, wooded grassland and woodland habitat <p>Flora and fauna stress and/or fatalities as a result of pollution of grassland, wooded grassland and woodland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills.</p> <hr/> <p>Cumulative Impacts:</p> <p>none</p>	<p>LOW</p>	<ul style="list-style-type: none"> ○ 7.2.10. General rehabilitation guidelines ○ 7.2.11. Construction phase monitoring measures <hr/> <ul style="list-style-type: none"> • The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved. • No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. • Once the location of the pylons / towers and access / service roads are confirmed, a botanist must visit the footprint sites at the appropriate time of year to identify and map the location of all threatened and protected plants. Once the identity and location of all threatened and protected plants are confirmed, permits to remove and translocate such species must be acquired and a search and rescue plan must be compiled and implemented. This must be undertaken prior to construction commencing. • Prior to the commencement of any construction activities, the following features must be staked out by a surveyor and demarcated using brightly coloured shade cloth: <ul style="list-style-type: none"> ○ Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. ○ The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. ○ The outer edges of the entire construction corridor / right-of-way. • Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> ○ 7.1.1. Powerline Alignments and Pylon Siting ○ 7.1.2. Powerline Access and Service Roads ○ 7.2.1. Powerline 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 	<p>LOW</p>

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
			<ul style="list-style-type: none"> ○ 7.2.4. Method Statements for working in primary grasslands ○ 7.2.8. Prohibitions related to animals ○ 7.2.10. General rehabilitation guidelines ○ 7.2.11. Construction phase monitoring measures 	
OPERATIONAL PHASE IMPACTS				
<p>Accidental direct impacts to primary and secondary grassland by heavy machinery during repair and maintenance i.e. poorly planned access roads.</p>	<p>Direct Impacts: <i>Impacts to terrestrial vegetation communities and habitat:</i></p> <ul style="list-style-type: none"> • Destruction and modification of primary and secondary grassland <p>Indirect Impacts:</p> <ul style="list-style-type: none"> • Erosion and/or sedimentation of primary and secondary grassland due to soil and vegetation clearing and landcover disturbance during repair and maintenance. • Pollution of primary and secondary grassland due to the mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance. • <p>Cumulative Impacts: Negligible degradation of primary grassland type if the recommended mitigation measures are effectively implemented.</p>	MODERATELY-LOW	<ul style="list-style-type: none"> • Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> ○ 7.3.1. Maintenance and management ○ 7.3.2. Monitoring 	LOW
<p>Accidental direct impacts to primary and secondary grassland by heavy machinery during repair and maintenance i.e.</p>	<p>Direct Impacts: <i>focussing on avifauna, the destruction and modification impacts:</i></p> <ul style="list-style-type: none"> • Bird injury and fatalities as a result of powerline bird collisions and electrocutions. • Fauna displacement and/or fatalities 		<ul style="list-style-type: none"> • The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved. • No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. 	

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>poorly planned access roads.</p> <p>soil and vegetation clearing and landcover disturbance during repair and maintenance.</p> <p>mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance.</p>	<p>Indirect Impacts:</p> <ul style="list-style-type: none"> Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of primary and secondary grassland Flora and fauna stress and/or fatalities as a result of pollution of primary and secondary grassland <p>Cumulative Impacts: Small reductions in threatened bird populations due to increased local and regional powerline collisions.</p>	<p>MEDIUM</p>	<ul style="list-style-type: none"> Mitigation measures to reduce the occurrence of bird collisions with powerlines: <ul style="list-style-type: none"> The entire length of the powerline must be fitted with bird flight diverters at 5m intervals (i.e. high contrast, reflective or moving markers). The line configuration used must ensure that the number of planes of the wires is reduced to the minimum required and there are no ground wires in line with the current best environmental options. Mitigation measures to reduce the occurrence of bird electrocutions: <ul style="list-style-type: none"> Ensure that an appropriate bird friendly tower design is chosen and that applicable bird perch brackets are installed e.g. All cables close to poles must be insulated. Pylons / towers should include safe perches located at a safe distance from energised structures. Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> 7.1.1. Powerline Alignments and Pylon Siting 7.1.2. Powerline Access and Service Roads 7.1.4. Avifauna Impact Mitigation Design Measures 7.3.1. Maintenance and management 7.3.2. Monitoring 	<p>MODERATELY-LOW</p>
<p>Due to soil and vegetation clearing and landcover disturbance during repair and maintenance.</p> <p>Accidental direct impacts to primary and secondary grassland by heavy machinery during dismantling and</p>	<p>Direct Impacts: <i>Impacts to local and regional landscape ecological processes</i></p> <ul style="list-style-type: none"> Fauna displacement and/or fatalities <p>Indirect Impacts:</p> <ul style="list-style-type: none"> Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of primary and secondary grassland Flora and fauna stress and/or fatalities as a result of pollution of primary and secondary grassland 	<p>LOW</p>	<ul style="list-style-type: none"> The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved. No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. Refer to section 7 of Appendix E2 for general mitigations on <ul style="list-style-type: none"> 7.1.1. Powerline Alignments and Pylon Siting 7.1.2. Powerline Access and Service Roads 7.1.4. Avifauna Impact Mitigation Design Measures 	<p>LOW</p>

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
rehabilitation i.e. poorly planned access roads.	<p>Cumulative Impacts:</p> <p>If mitigation measures are adequately implemented, no cumulative impacts are expected.</p>		<ul style="list-style-type: none"> ○ 7.3.1. Maintenance and management ○ 7.3.2. Monitoring 	

7.2.3 Heritage Impact Assessment

The table 7.3 below list the activities that could impact on Heritage as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.3: Heritage Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
Concrete road bridge: This feature is located inside the larger project area, but due to its position on the western side of the main road, whereas the power line will be constructed on the eastern side of the same road, it is highly unlikely that it would be impacted on negatively.	Direct Impacts: Loss or damage to sites, features or objects of cultural heritage significance	LOW	<ul style="list-style-type: none"> No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report. This is also applicable where the identified feature is located in such a position that the proposed development is unlikely to impact on the site. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation to ensure that no accidental damaged is caused to the features or that undetected heritage/remains are destroyed. In the event of an impact occurring on the identified site or feature, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out. 	LOW
	Indirect Impacts: restriction of access or visual intrusion concerning the broader environment;			
	Cumulative Impacts: Construction activities may result in cumulative impact to the fossiliferous layers It is very important that protective measures should be put into place and monitored.			
1. Removal of Vegetation 2. Construction of required infrastructure, e.g.	Direct Impacts: Loss or damage to burial sites within the project boundaries;	MEDIUM	<ul style="list-style-type: none"> Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and 	LOW
	Indirect Impacts: Low risk anticipated provided that the mitigation measures are implemented correctly			

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
access roads, water pipelines	Cumulative Impacts: Loss of a limited number of similar features in the larger landscape.		therefore impact zones in order not to impact on resources. <ul style="list-style-type: none"> The site should be retained in situ and should be fenced off, with a buffer zone of at least 20m. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation to ensure that no accident 	
OPERATIONAL PHASE IMPACTS				
Operation of the power line	Loss or damage to burial sites within the project boundaries	Negligible	<ul style="list-style-type: none"> Maintenance activities should not impact on features or objects of cultural heritage significance 	Negligible

7.2.4 Palaeontological impact assessment

The table 7.4 below list the activities that could impact on the palaeontological aspect of the site as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.4: Palaeontological impact assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
The sources of these impacts include the removal of vegetation, sealing-in or destruction of fossils, and digging of foundations. This activity is particularly significant where pylons are constructed.	Direct Impacts: Destruction, Damage & Loss of fossil material	LOW	<ul style="list-style-type: none"> Footprint of Pylon 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
	Indirect Impacts: Impacts to fossiliferous outcrops are likely to be permanent unless rehabilitated.			
	Cumulative Impacts: Construction activities may result in cumulative impact to the fossiliferous layers It is very important that protective measures should be put into place and monitored.			
OPERATIONAL PHASE IMPACTS				
	Destruction, Damage & Loss of fossil material	LOW	<ul style="list-style-type: none"> Maintenance activities should not impact on fossiliferous outcrops Maintenance vehicles must stay on dedicated roads/ servitudes 	LOW

7.2.5 Visual Impacts Assessment

Table 7.4 below list the activities that could impact on Visual of the area as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.4: Visual Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
<p>The construction phase will introduce new elements to the visual environment (i.e. construction teams and equipment) that are otherwise uncharacteristic within the context of the study area. The construction activity will cause damage to the existing vegetation cover and expose the underlying soil due to the movement of the technical team and the operation of construction equipment. This will cause the removal of the plant cover that is part of the baseline character of the study area. Unsightly scarring of the landscape will negatively impact on the visual quality of the visual resource and the natural character of the site. Visual intrusion can be expected due to the unsightly construction activity and the influence on the visual quality of the landscape character. As the powerline construction continues and the overall height of the project increases, the ZVI will increase and affect more observers.)</p>	<p>Direct Impacts: Severity of impacts on observers (OB) and landscape character (LC)</p> <p>Indirect Impacts: 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.</p> <p>Cumulative Impacts: A risk of cumulative impacts is highly likely as the study area already features 400kV and 88kV powerlines and the addition of two new powerlines will increase the visual dominance of the electrical infrastructure.</p>	MEDIUM	<p>1. Avoidance 1.1. Avoid constructing an overhead powerline by considering an underground cable. Trenching may have other negative visual and landscape impacts, but the long-term impacts can be effectively mitigated;</p> <p>2. Reduction 2.1. Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area and keeping the disturbance footprint as small as possible. 2.2. Locate the lay-down area and construction camp in an area that is already disturbed and screened from sensitive viewpoints. 2.3. Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the powerline servitude.</p> <p>3. Remediation 3.1. 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. 3.2. Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.</p> <p>4. Enhancement 4.1. Rehabilitate the disturbed area as soon as possible to minimise the impact of exposed soil and re-establish a vegetation cover.</p>	MEDIUM
OPERATIONAL PHASE IMPACTS				

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>The completed project will introduce two new powerlines to the study area, thereby increasing the visual dominance of electrical infrastructure and causing a noticeable visual change to the baseline environment. The new powerlines will cause intrusions on observers' views especially on those observers living within 1 km of the servitude.</p>	<p>Direct impacts:</p> <p>Severity of impacts on observers (OB) due to:</p> <ul style="list-style-type: none"> • Visual change that will cause visual intrusion. • Alteration to the landscape character. • Increased visual dominance of power infrastructure. 	<p>HIGH</p>	<p>Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature;</p>	<p>VERY LOW</p>
<p>The industrial character of the powerlines will contrast with the rural/natural landscape character, although the presence of other powerlines mitigates the unfamiliarity of such anthropogenic additions.</p>	<p>Direct impacts:</p> <p>Severity of impacts on the landscape character (LC) due to:</p> <ul style="list-style-type: none"> • Visual change that will cause visual intrusion. • Alteration to the landscape character. • Increased visual dominance of power infrastructure. 	<p>MEDIUM</p>	<p>Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature;</p>	<p>VERY LOW</p>

7.2.6 Agriculture Potential Impact Assessment

Table 7.6 below list the activities that could impact on Social as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.6: Agricultural Potential Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
Construction activities (pylons/power lines), Vehicle operation on site, Dust generation and the creation of access roads.	Direct Impacts: Loss of agricultural land	LOW	<ul style="list-style-type: none"> Mitigation includes detail planning of the exact position of the pylons and lines in co-operation with the farmers to establish the optimal path that will limit losses in current and future agricultural production as 	LOW
	Indirect Impacts: Overall loss of farmland, income and change in livelihood			
	Cumulative Impacts: Pylon footprints are limited in spatial extent and once in place do not leads to additional spatial or land use impacts.			
OPERATIONAL PHASE IMPACTS				
Operation of the power lines	Loss of agricultural production	LOW	<ul style="list-style-type: none"> Pylon footprints and infrastructure are permanent and the pylons cannot be mitigated 	LOW

7.2.7 Social Impact Assessment

Table 7.7 below list the activities that could impact on Social as a result of the construction of the power line, as well as impacts that may be associated with the operation and maintenance thereof.

Table 7.7: Social Impact Assessment

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

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Construction activities of the power line	<p>Direct Impacts: Inflow of Workers</p> <hr/> <p>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.</p> <hr/> <p>Cumulative Impacts: Construction workers remaining in the larger area once this development has been completed.</p>	LOW	<ul style="list-style-type: none"> 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 activities of the power line	<p>Direct Impacts: Employment Opportunities (positive)</p> <p>Indirect Impacts: Construction workers remaining in the larger area once this development has been completed.</p> <p>Cumulative Impacts: Construction workers remaining in the larger area once this development has been completed.</p>	LOW	<p>Enhancements:</p> <ul style="list-style-type: none"> 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

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
<p>Construction machinery that is usually used for projects of this nature includes excavators, TLB's, tipper trucks and compactors</p>	<p>Direct Impacts: Disturbance of daily Living and Movement Patterns</p> <p>Indirect Impacts: Intrusion impacts associated with the construction activities would relate to noise and dust pollution and the impact on the residents' daily living and movement patterns.</p> <p>Cumulative Impacts: Possible impact on daily living and movement patterns due to various power lines within the study area</p>	<p>LOW</p>	<ul style="list-style-type: none"> Working hours should be kept to normal working hours (e.g. 7 am until 5 pm) during the construction phase. Construction vehicles should keep to the speed limits. Speeding on gravel access roads should also be avoided to limit any excess dust pollution. Clear warning signs should be erected at strategic places during the construction phase. The contractor should contact affected property owners before construction commences to inform them of the contractor's plans, procedures, and schedules. Construction sites should be fenced off to limit unauthorised entry. Sufficient water and sanitation facilities should be provided for the workers on site during the construction period. Construction sites should be rehabilitated as soon as the construction activities and planning allows. 	<p>LOW</p>
<p>Construction activities of the power line</p>	<p>Direct Impacts: Impact on Sense of Place</p> <p>Indirect Impacts: Possible negative visual change in the landscape character</p> <p>Cumulative Impacts: Possible impact on overall visual environment due to various power lines and infrastructure within the study area</p>	<p>LOW</p>	<ul style="list-style-type: none"> Construction sites should be screened from the property owners and motorists 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 	<p>LOW</p>
<p>Construction activities of the power line</p>	<p>Direct Impacts: Safety and Security Related Impacts</p> <p>Indirect Impacts: Increased risks of fires due to presence of the power line</p> <p>Cumulative Impacts:</p>	<p>LOW</p>	<ul style="list-style-type: none"> Before construction commences, the affected property owners, should be informed of the details of the contractors, size of the workforce and construction schedules. Working hours should be kept to normal working hours (e.g. 7 am until 5 pm) during the construction phase. Construction workers and permanent employees should be easily identifiable by wearing uniforms and even identity tags. Construction workers should refrain from unauthorised entry on private properties and 	<p>LOW</p>

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
	None anticipated		<p>should thus remain within the construction site boundaries.</p> <ul style="list-style-type: none"> The construction sites should be properly fenced and access should be controlled to limit unauthorised entry. Eskom should take a strong stance with regards to the illegal entering of the servitude areas Eskom should, in conjunction with the Local Municipality, develop an emergency management plan to specifically deal with the increased risk of fires 	
OPERATIONAL PHASE IMPACTS				
Operation of the power line	Direct Impacts: Impact on Land Use and Future Developments	LOW	<ul style="list-style-type: none"> The contractor should contact affected property owners before construction commences to inform them of the contractor's plans, procedures, and schedules. Consideration should be given to the placement of the towers and the type of towers that would be used. Towers with the smallest footprint with its associated more confined impact would be preferable A servitude with the least impact on the resource use and potential development of the properties would be recommended 	LOW
	Indirect Impacts: Possible change in land-use along sections of the line			
	Cumulative Impacts: Pressure on the rural type of land-use in the area within an urban setting due to all the development pressure			
Operation of the power line	<p>Direct Impacts: Impact on Property Values</p> <p>Indirect Impacts: Possible negative impacts on select properties</p> <p>Cumulative Impacts: Possible impact on overall visual environment due to various power</p>	LOW	<ul style="list-style-type: none"> Careful consideration should be given to the tower designs in order to minimise impacts on existing structures and activities on affected properties. Careful consideration should be given to the final route alignment and tower placements to ensure minimal disruption of resources and infrastructure, especially on the smaller properties. Where possible, towers should be placed on the border of properties if this would have a reduced negative impact on the resource use and potential development of the property Visual screening around the substation site should be considered 	LOW

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Operation of the power line	<p>Direct Impacts: Impact on Sense of Place</p> <p>Indirect Impacts: Possible negative visual change in the landscape character</p> <p>Cumulative Impacts: Possible impact on overall visual environment due to various power lines and infrastructure within the study area</p>	<p>LOW</p>	<ul style="list-style-type: none"> • Construction sites should be screened from the property owners and motorists 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 	<p>LOW</p>

8 CONCLUSIONS AND RECOMMENDATIONS

The previous chapters of this report together with the specialist studies contained within **Appendix E** provide a detailed assessment of the potential impacts that may result from the proposed project. This chapter concludes the Basic Assessment Report for the proposed Nzalo 88kV Powerlines 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. Specialists findings Summary

The specialist findings are summarised as follows:

Aquatic and Wetland:

The proposed powerline alignments effectively avoid wetlands and crosses two river units only at near right angles. The authors are thus of the opinion that the proposed alignments are acceptable from an environmental planning perspective. However, the construction of powerlines could have significant freshwater ecosystem impacts if the pylons are constructed within or near the rivers and wetlands. The most significant impacts are the potential direct impacts during the different phases of the project and the indirect erosion and sedimentation impacts during the construction. Even if the pylons are planned to avoid the wetland and riparian areas, the establishment of access roads during all phases of the project could have unintended impacts to watercourses if poorly planned. Nevertheless, if all the mitigation measures listed in Appendix E1 of this report are effectively adhered to. The significance of the identified impacts will be of **low significance**. In particular, the most important project design measures will be to ensure that all pylons avoid watercourses and access and service roads follow the alignments and use existing river crossings. Similarly, all the impacts will be of low risk under a good mitigation scenario. There are thus no fatal flaws associated with the project and all potential impacts can be effectively managed.

Terrestrial Biodiversity (vegetation and Fauna)

In conclusion, provided that the mitigation measures recommended in this report are adhered to, and that formal comment from an ornithologist confirms that the impacts to threatened avifauna will be acceptable with mitigation, **it is unlikely** that the proposed construction activities will result in significant adverse impacts on terrestrial biodiversity. The reasons for this conclusion are: the degraded nature of most of the communities and habitats along the alignment; the poor suitability of the habitat for species of conservation concern; the small anticipated on-the-ground footprint of the project activities; and the short length of the powerline.

Heritage Assessment:

During the survey no sites, features or objects of cultural significance were identified.

- Old single lane concrete low water bridge. It originally formed part of the old alignment of the road (number unknown), which was later changed to straighten it out.
- A single grave marked by a stone cairn. It seems to be very old as it is total overgrown with trees. No other signs of habitation could be detected.

- An informal burial site with approximately 12 graves. All are only marked with stone cairns and some have aloes planted on them. These graves belong to the existing and previous homesteads that occur in its immediate vicinity.
- A large area that has been fenced off with wire to create a formal community cemetery. It currently has more than 30 graves, some with headstones. It is possible that some older graves are located outside on the southern side of the fence, but due to the dense grass cover it was difficult to confirm this fact.

From a heritage point of view, it is recommended that the Proposed Project be allowed to continue on acceptance of the mitigation measures presented in the report (see **Appendix E3**).

Palaeontological Assessment:

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

Visual Assessment

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

The sources of visual impacts will originate from the construction activity and the presence of a workforce and machinery operating during the construction process. When this is complete, the newly constructed powerlines 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, increases the VAC and limits the ZVI. The inherent mitigation factors are not enough to completely eliminate the potential impacts, and additional mitigation measures should be considered.

Observers in the study area will be affected differently by the potential impacts, due to their distance away from the source of impact and their sensitivity towards their visual environment. Residents of the farming community are considered the most sensitive observers if they are located within 1km from the source of impact, i.e. the Zone of Maximum Visual Exposure (ZMVE). The residents within this zone are expected to experience high levels of visual intrusion and consequently a high significance of visual impact without the implementation of mitigation measures. The rural community of Doornkloof are located approximately 6km to the east of the proposed powerline near the Manzana River. Their sensitivity rating is much lower due to the distance from the source of impact.

The landscape character will experience a transformation as two additional powerlines will increase the visual dominance of electrical infrastructure in the study area. Currently, the landscape has rural characteristics as a result of its land uses and natural features. The additional powerlines will contribute to a more developed character by impacting on the visual quality of the existing environment.

Impacts can be marginally mitigated during the construction phase, but little can be done to mitigate impacts during the operational phase unless major layout or design changes are considered. One such consideration is the avoidance of an overhead powerline and the installation of an underground cable. This is subject to technical and cost-benefit scrutiny by the applicant, but is mentioned in this assessment as the most effective mitigation measure to address the potential impacts. **No fatally flawed issues are identified.**

Agricultural Potential Assessment

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

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

Social-Economic Impact Assessment

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

Although negative social impacts would be experienced, the necessary electrical input into the Transnet railway system is vital. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard's Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves. In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported

Cumulative Impact Assessment:

Ecology: Due to the largely modified and secondary nature of much of the vegetation, the proposed development could accelerate degradation, fragmentation and erosion in the area. However, cumulative impacts on the vegetation and watercourse can be limited if mitigation measures as set out in this report are adhered to as a minimum. A fairly extensive power line network features in the broader study area, also commercial afforestation activities feature in the broader study area is one source of existing disturbance. These activities, coupled with the limited habitat diversity are a likely cause of the absence of Red List species within the impact zone. Those species that have persisted have undoubtedly developed a tolerance for the current levels of disturbance and are likely to persist within the broader area despite these developments cumulatively.

Avifauna: In terms of the risk of electrocution, the addition of additional towers along the proposed deviation outside of the authorised corridor may increase the electrocution risk for certain species. Electrocutions on the power line towers outside of the proposed deviation will have a medium to low cumulative impact if properly mitigated.

Visual: In terms of the visual impact of the area, cumulative impacts are generally probable and the visual dominance of electrical infrastructure will be increased and aggravates visual intrusion levels. A risk of cumulative impacts is highly likely as the study area already features 400kV and 88kV powerlines and the addition of two new powerlines will increase the visual dominance of the electrical infrastructure

No-go alternative

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current status quo. However, should Eskom and Transnet not proceed with the development of the proposed **the Nzalo 2x 88kV Power Lines Project**, the necessary electrical input into the Transnet railway system will not be present. This will prevent Transnet from increasing the locomotive traffic between Richards Bay, KwaZulu-Natal and Ermelo, Mpumalanga and subsequently prevent increased coal transport to Richards Bay harbour for export. The proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Ermelo-Richards Bay Coal Link Upgrade project is therefore a major economic undertaking from which South African citizens can benefit.

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

8.2. Summary of Impacts

A summary of the impact assessments is presented in **Table 8.1**; 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 8.1** 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 8.1: Impact Summary table

CONSTRUCTION PHASE		
Environmental Aspect	Without Mitigation	With Mitigation
Aquatic and Wetland Impact Assessment		
Impacts to Water Resource Quality and Quantity	Moderately-Low	Low

Impacts to Freshwater Ecosystem Conservation	Moderately-Low	Low
Impacts to Freshwater Species Conservation	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat: Destruction and modification of primary and secondary grassland	Medium	Low
Impacts to terrestrial biota / species (flora and fauna): ecosystem destruction and modification to grassland, wooded grassland and woodland & Fauna displacement and/or flora and fauna fatalities	Moderately-Low	Low
Impacts to local and regional landscape ecological processes: Ecosystem fragmentation & Fauna displacement and/or fatalities	Low	Low
Heritage & Paleo Impact		
Loss or damage to sites, features or objects of cultural heritage significance	Low	Low
Loss or damage to burial sites within the project boundaries	Medium	Low
Destruction, Damage & Loss of fossil material	Low	Low
Visual Impacts		
Severity of impacts on observers (OB) and 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
Disturbance of daily Living and Movement Patterns	Low	Low
Impact on Sense of Place	Low	Low
Safety and Security Related Impacts	Low	Low
OPERATIONAL PHASE		
Environmental Aspect	Without Mitigation	With Mitigation
Aquatic and Wetland Impact Assessment		
Impacts to Water Resource Quality and Quantity	Moderately-Low	Low
Impacts to Freshwater Ecosystem Conservation	Moderately-Low	Low
Impacts to Freshwater Species Conservation;	Moderately-Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat: Direct ecosystem destruction and modification impacts	Moderately-Low	Low
Impacts to terrestrial biota / species (Avifauna) <ul style="list-style-type: none"> Bird injury and fatalities as a result of powerline bird collisions and electrocutions. Fauna displacement and/or fatalities 	Medium	Moderately-Low
Impacts to local and regional landscape ecological processes: Fauna displacement and/or fatalities	Low	Low
Heritage & Paleo Impact		
Loss or damage to burial sites within the project boundaries	Negligible	Negligible
Visual Impacts		
Severity of impacts on observers (OB) due to: <ul style="list-style-type: none"> Visual change that will cause visual intrusion. 	High	Very Low

<ul style="list-style-type: none"> • Alteration to the landscape character. • Increased visual dominance of power infrastructure 		
Severity of impacts on to the landscape character (LC)	Medium	Very Low
Agriculture Potential Impact		
Loss of agricultural production	Low	Low
Social Impacts		
Impact on Land Use and Future Developments	Low	Low
Impact on Property Values	Low	Low
Impact on Sense of Place	Low	Low

8.3. **Environmental Sensitivities Mapping**

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 route. The following **high sensitive areas/environmental features** as shown in **Figure 8.1** have been identified on the site:

- **Aquatic and Wetland:** Two (2) riverine units (NZA R01 and NZA R02) were delineated and assessed within 500m of the proposed Nzalo powerlines alignments, however **only one (NZA R02) will be directly impacted by the proposed project.**
- **Terrestrial Biodiversity**
 - Several protected plants were observed along and in the vicinity of the powerline alignments within the majority falling within the approved corridor
 - Degraded primary grasslands were rated as being of **moderately-high** sensitive.
- **Heritage features:**
 - Old single lane concrete low water bridge: This feature is located inside the larger project area, but due to its position on the western side of the main road, whereas the power line will be constructed on the eastern side of the same road, it is highly unlikely that it would be impacted on negatively
 - Burial site 1: This site is located approximately 75m west of both the proposed power line routes.
 - Burial site 2: This site is located approximately 180m north of the proposed Normandie-Nzalo power line route.
 - Burial sites 3: This site is located approximately 140m south of the proposed Normandie-Nzalo power line route.

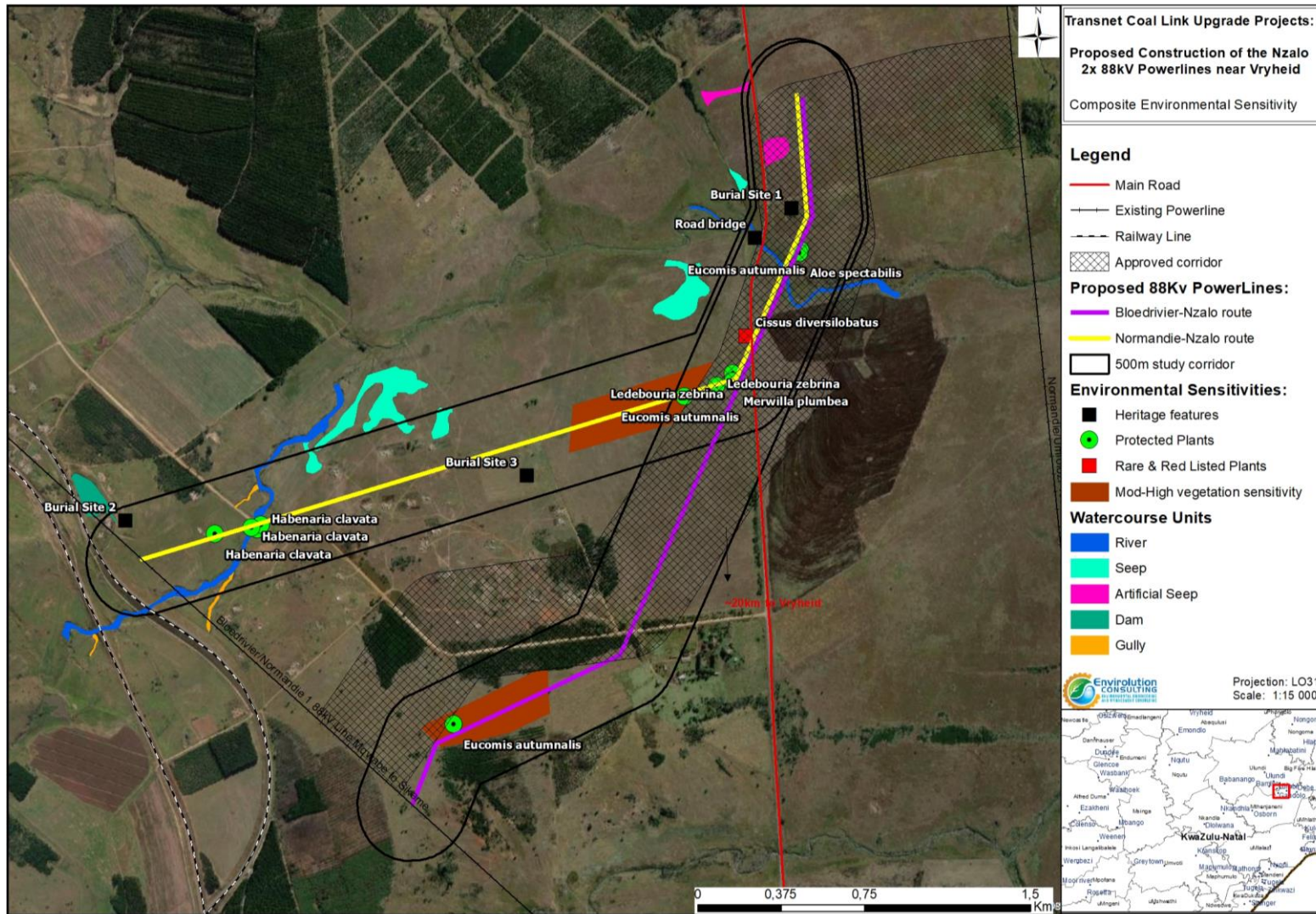


Figure 8.1: Composite Environmental Sensitivity Map for the proposed Nzalo 88kV Powerlines showing areas of high sensitivity (A3 map included in Appendix A).

8.4. Conclusion (Impact Statement)

As summarised in Table 8.1 (see section 8.2), it's been noted that most of the negative impacts associated with the construction of the proposed Nzalo 88kV Powerlines are localised, short-term (i.e. during the construction phase) and can be successfully **mitigated to lower significance** if all mitigation measures identified and included in the Environmental Management Programme (EMPr) attached in Appendix H. *Sensitive ecological features as mentioned in **section 8.3** and shown in the environmental sensitivity map (**Figure 8.1**) could be avoided during the detail design phase of the project, by careful placing of tower footprint within the 500m study corridor.* Other features of significance would be the possible occurrence of buried heritage artefacts, graves or fossils, however mitigation measures through monitoring and recording have been proposed for any chance finds/discoveries.

Due to the nature of a powerline, total avoidance of the high environmental sensitivity areas as **shown in Figure 8.1** may not be possible. However, it is worth noting that the overall impacts to the above mentioned environmental sensitive features would be less than 3% of the total development footprint, and would be considered acceptable loss. Positive socio-economic impacts are associated with job creation which would materialise during the Construction phase, thus contributing towards the reduction of unemployment rates in local municipalities as the proposed project is part of a Strategic Infrastructure Plan, aimed at increasing the coal mining industry and economic profile of South Africa, with a total CAPEX value of over 1 billion Rand and an employment opportunity value of over 48 million Rand, 80% of which is to be allocated to previously disadvantaged individuals. The Ermelo-Richards Bay Coal Link Upgrade project is therefore a major economic undertaking from which South African citizens can benefit.

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

It is also recommended that a formal communication channel be developed between Eskom and the affected property owners for planning, evaluation and monitoring purposes. Careful planning and negotiations with land owners will be of crucial importance before finalising the exact placement of the pylons and 31m servitude within the 500 corridor that was evaluated. This will minimise the direct (mostly visual) impacts by investigating slight deviations in the route where necessary.

8.5. Recommendations

The EAP **recommends** that the **Proposed Construction of the Nzalo 2x 88kv Power Lines near Vryheid be authorised** as all impacts identified are localised and manageable. 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.

Site-specific conditions to be noted include:

- **Aquatic and Wetland:**

- The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided
- No pylons or towers must be established within or within 50m of any wetlands or riparian areas.
- Where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following
 - * Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings.
 - * The length of wetlands and rivers / streams crossed at each crossing must be minimised by adjusting alignments to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.
- Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 30m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.
- Demarcation of 'No-Go' areas and construction corridors Prior to the commencement of any construction activities,

- **Terrestrial Biodiversity:**

- The number of pylons or towers within the vegetation communities of moderately-high importance (i.e. primary grasslands) must be minimised to the minimum number necessary and maximum span lengths across primary grasslands must be achieved.
- No pylons or towers must be established within or within 50m of any wetlands or riparian areas and/or dolerite outcrops. to coincide with narrower sections and ensuring that crossings cross perpendicular to flow.
- Once the location of the pylons / towers and access / service roads are confirmed, a botanist must visit the footprint sites at the appropriate time of year to identify and map the location of all threatened and protected plants. Once the identity and location of all threatened and protected plants are confirmed, permits to remove and translocate such species must be acquired and a search and rescue plan must be compiled and implemented. This must be undertaken prior to construction commencing.
- Demarcation of 'No-Go' areas and construction corridors Prior to the commencement of any construction activities,

- **Avifauna:**

- The entire length of the powerline must be fitted with bird flight diverters at 5m intervals (i.e. high contrast, reflective or moving markers).
- The line configuration used must ensure that the number of planes of the wires is reduced to the minimum required and there are no ground wires in line with the current best environmental options.
- Ensure that an appropriate bird friendly tower design is chosen and that applicable bird perch brackets are installed e.g. All cables close to poles must be insulated. Pylons / towers should include safe perches located at a safe distance from energised structures.

- **Heritage:** Avoidance/Preserve is viewed to be the primary form of mitigation and the site should be retained in situ and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.

General conditions includes

- 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.
 - Creation of new access roads should be minimised as far as possible.
 - The visual and intrusion impacts are of concern, as well as the negative impact on the property value. In this regard, it is therefore recommended that the entire property for the substations be obtained by Eskom. Should this mitigation measure be implemented.
 - 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.
 - Rehabilitate construction sites by establishing with indigenous plant species, within the safety specifications for a power line. The 3m servitude for the underground cable servitude should be kept clear of plants to allow maintenance and repairs in future.
 - Erosion control measures must be utilised during construction, operations, decommissioning and rehabilitation of the power lines, cables and substations.
 - Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
 - The developer should obtain all necessary permits prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species

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