BASIC ASSESSMENT PROCESS

for

THE PROPOSED CONSTRUCTION OF THE VRYHEID 2X 88 KV TURN-IN POWER LINES IN THE ABAQULUSI LOCAL MUNICIPALITY, KWAZULU-NATAL

DRAFT BASIC ASSESSMENT REPORT

Public Review

21 May 2021 to 21 June 2021

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PROJECT DETAILS

DEA Reference No.	**:**	Not assigned as yet
Title	**:**	Basic Assessment Process for the Proposed Construction of the Vryheid 2x 88 kV Turn-In Power Lines in the Abaqulusi Local Municipality, Kwazulu-Natal
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Client	:	**Eskom Holdings SOC Ltd**
Status	**:**	Draft Basic Assessment Report
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Approved By:		Gesan Govender

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ABBREVIATIONS AND ACRONYMS

BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and Environment
DoE	Department of Energy
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance & Sensitivity
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP's	Integrated Development Plans
Km	Kilometres
Kv	kilovolts
KZN	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—	Appendix G1
(a) details of—	
(i) the EAP who prepared the report; and	
(ii) the expertise of the EAP, including a curriculum vitae;	
(b) the location of the activity, including:	Appendix G3
i. the 21 digit Surveyor General code of each cadastral land parcel;	
ii. where available, the physical address and farm name;	
iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Appendix A & Appendix G3
or, if it is-	
i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	
ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
(d) a description of the scope of the proposed activity, including—	Section 3.1
i. all listed and specified activities triggered and being applied for; and	Section 2.2
ii a description of the activities to be undertaken including associated structures and infrastructure;	
(e) a description of the policy and legislative context within which the development is proposed including—	Section 3.2
iii. an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	
iv. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 2.3
(g) a motivation for the preferred site, activity and technology alternative;	Section 2.3)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including—	i. Section 2.4
i. details of all the alternatives considered;	ii. Chapter 4 & Appendix D
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. Appendix D: Public Participation Process
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. Chapter 5 v. Chapter 6 vi. Chapter 7 vii. Chapter 7 viii. Chapter 7
iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	ix. Chapter 7 x. Section 2.4 xi. Section 8.4
v. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of	

	the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; vi. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. the possible mitigation measures that could be applied and level of residual risk; ix. the outcome of the site selection matrix; x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity;	
(i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 7
(j)	an assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Chapter 7
(k)	where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 8 (section 8.1)
(l)	an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas tha should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 8 (section 8.4)
(m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Appendix E
(n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 8
(o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 6 (Section 6.7)
(p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any	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 *gazetted* by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply		N/A

EXECUTIVE SUMMARY

INTRODUCTION
The proposed construction of the Vryheid 2x 88 kV Turn-In Power Lines Project within the 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 Development of the Vryheid Traction Station and the Associated Eskom Turn-In Power Lines in KwaZulu-Natal Province. 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 Vryheid 2 x 88kV Powerlines.

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 PROCESSNTRODUCTION
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
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.

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 **Vryheid 2x 88 kV Turn-In Power Lines** 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*.

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 he 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 Vryheid 2x 88 kV Turn-In 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 30m 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 distance between of the powerlines and pylon / tower sites and the mountain slopes with good condition wooded grassland must be maximised as far as practically possible.
- The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved.
- 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 constriction 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.

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 archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.
- 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 **Vryheid 2x 88 kV Turn-In 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 places:

Vryheid Library
Mark Street, Vryheid
034 982 2133

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

Environmental Assessment Practitioner

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The due date for comments on the Draft Basic Assessment Report is Monday, 21 June 2021.

1 INTRODUCTION

1.1 Project Background

The proposed construction of the Vryheid 2x 88 kV Turn-In Power Lines Project within the 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.

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In order to address this request, various projects were proposed including the Development of the Vryheid Traction Station and the Associated Eskom Turn-In Power Lines in KwaZulu-Natal Province. 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 Vryheid 2 x 88kV Powerlines.

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.

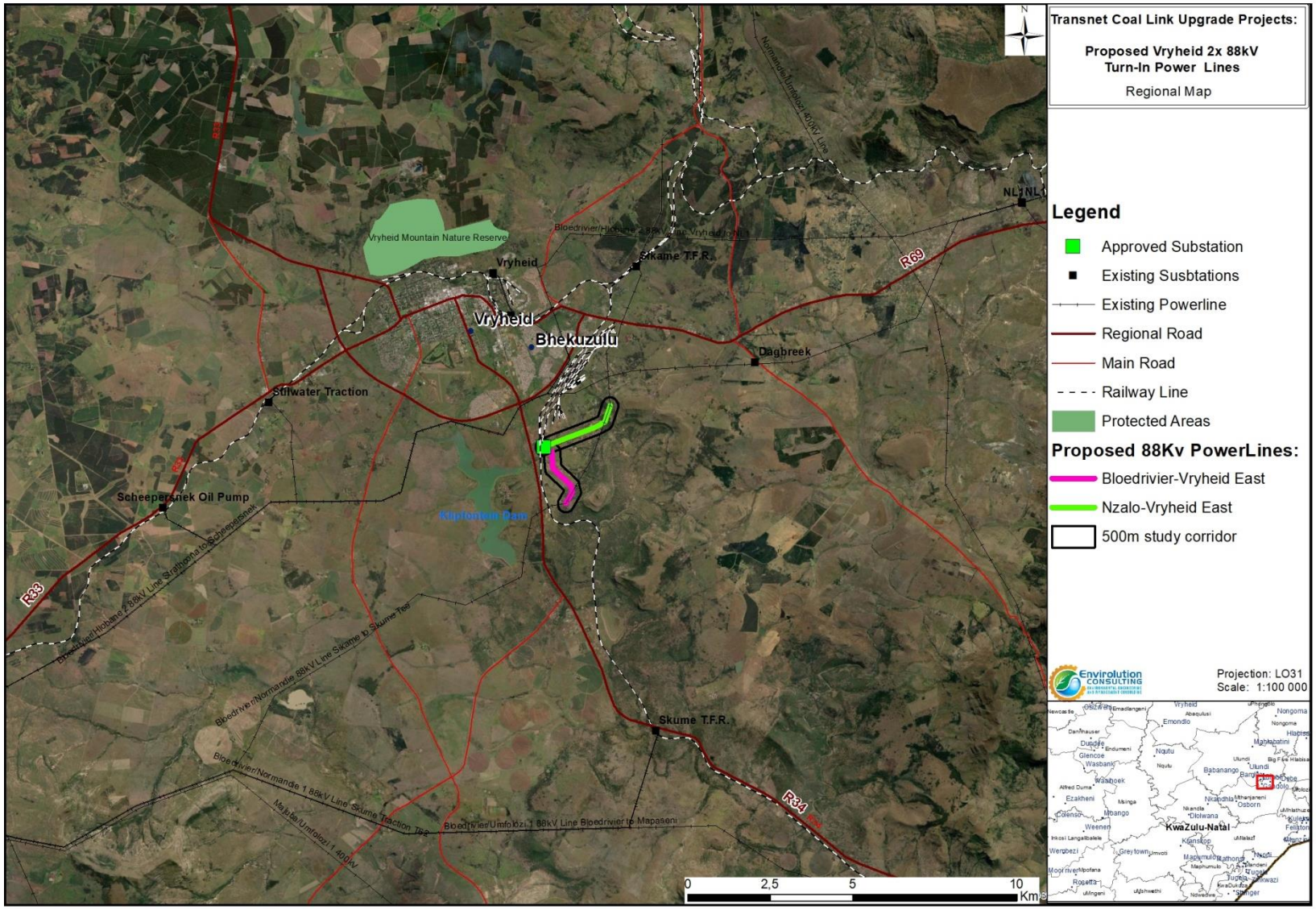

Figure 1.1: Regional map showing the proposed **Vryheid 2x 88 kV Turn-In Power Lines** within the broader area

1.2 Previous Environmental Impact Assessment Process

The authorisation for the previous application entailed the construction of an 88/25kV, 2 X 20MVA Vryheid Traction Station and associated 2 X 88kV and 2 X 25kV turn-in power lines, approximately 5km south-east of Vryheid, KwaZulu-Natal Province. An Environmental Authorisations for this project was secured on 27 October 2015 under the following reference number: 14/12/16/3/3/1/1104. **Table 1.1** provides a summary of the legal processes undertaken to date for the apllication.

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 (14/12/16/3/3/1/1104)
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 Vryheid Traction Station with associated 2 X 88kV 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 Vryheid 2x 88 kV Turn-In Power Lines.

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.

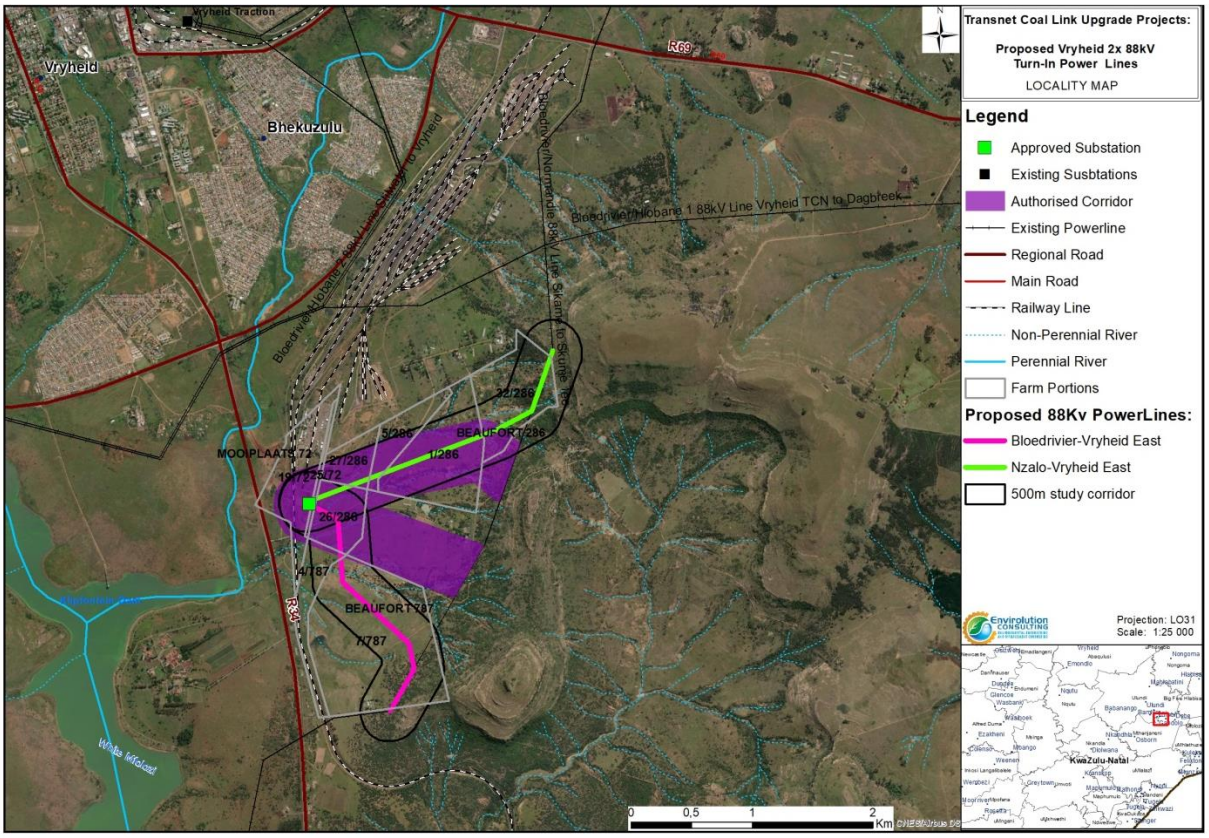

Figure 1.2: Locality Map of the proposed power line showing the previously Approved Corridor

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 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
Postal Address:	PO Box 1898, Sunninghill, 2157
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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 Project Location

The proposed development is situated approximately 4km south-east of the town of Vryheid, along the Transnet railway line within Ward 13 of the Abaqulusi Local Municipality 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 two proposed Turn-in Power lines is situated between the approved Traction Substation, approximately 70m east of existing Transnet Railway line and approximately 2km west of the Eskom 88kV power line, and the 88/25kV Vryheid Traction Substation is located south-east of the town of Vryheid. The proposed Power lines would run in a westerly direction between the existing Eskom 88kV power line and the proposed Vryheid Traction Substation with a total approximate length of 2km.

Access to the site is to comprise a single-lane existing access road turning off east from the R34 (Melmoth-Vryheid Road). 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 Nzalo-Vryheid East	810	2 876	32
88kV Bloedrivier-Vryheid East	1 575	2 436	32

Table 2.2: Power line co-ordinates:

Component	Start	Middle	End
88kV Nzalo-Vryheid East	27°48'3.30"S; 30°50'32.89"E	27°47'58.88"S; 30°50'41.86"E	27°47'42.51"S; 30°50'48.03"E
88kV Bloedrivier-Vryheid East	27°48'38.69"S; 30°49'44.79"E	27°49'1.90"S; 30°50'5.87"E	27°49'20.23"S; 30°50'0.46"E

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

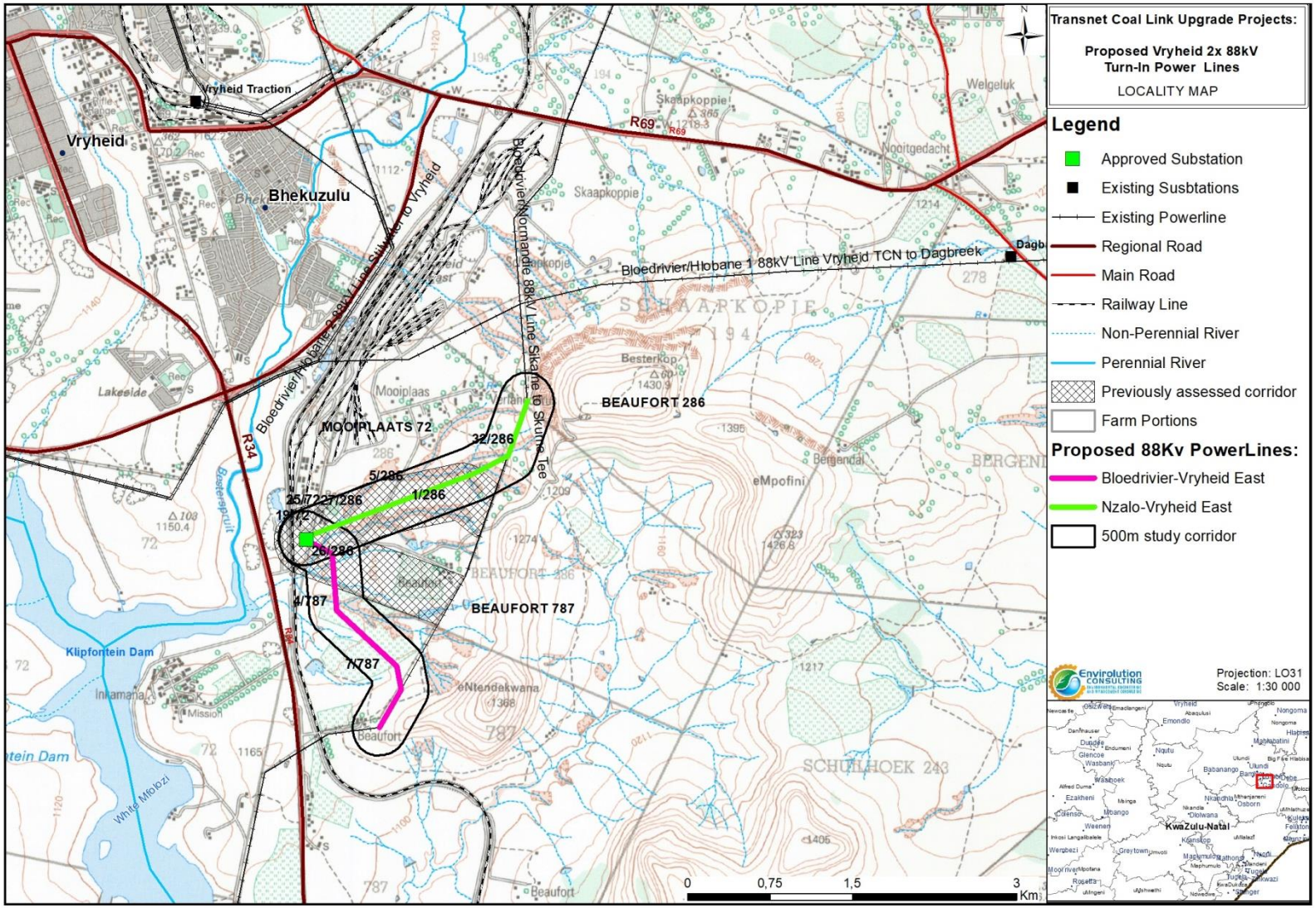

Figure 2.1: Locality Map showing the proposed powerline (including previously Approved Corridor)

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 **power line 500m 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 **Vryheid 2X 88 kV Turn-In Power Lines**, 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 Project 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 F) 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 D) 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 EMPr 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 Vryheid 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:** Access to the site is to comprise a single-lane existing access road turning off east from the R34 (Melmoth-Vryheid Road). 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. 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 Abaqulusi Local Municipality, 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 utilised 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 contactor 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.

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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
Activity 11 of **Listing Notice 1 (GNR 327, 07 April 2017):** Development of facilities or infrastructure for the transmission and distribution of electricity (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	The proposed development (power line) will be constructed outside the urban area and will transmit electricity of up to 88kV.
Activity 12 of Listing Notice 1 (GNR 327, 07 April 2017): The development of (ii) infrastructure or structures with a physical footprint of 100 square meters or more where such development occurs, — (a) Within a watercourse;	The erection of power line pylons 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.
Activity 19 Listing Notice 1 (GNR 327, 07 April 2017): 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	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.
Activity 27 Listing Notice 1 (GNR 327, 07 April 2017): The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	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.
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 **(d) Kwazulu-Natal:** v. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; or xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	The 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.
Activity 14 of Listing Notice 3 (GNR 324, 07 April 2017): (ii) infrastructure or structures with a physical footprint of 10	Power line pylons of more than 10 m² will be located within 32m of a watercourse on sites identified as Critical Biodiversity Areas

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	(CBAs) and within the KZN bioregional plans.

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
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GNR 326 of 2014 (as amended), a Basic Assessment Process is required to be undertaken for the proposed project. • ***An application for Environmental Authorisation (as triggered by the EIA Regulations 2014 (as amended) will be required. In terms of Section 28, every person who causes, has caused, or may cause significant pollution or degradation of the environment, must take reasonable measures to prevent pollution or rectify the damage caused. The undertaking of various specialist studies, in order to identify potential impacts on the environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.*** • ***In terms of the EIA regulations, the construction of the proposed 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***	Department of Forestry Fisheries and Environment (DFFE) – competent authority KwaZulu-Natal Department of Economic Development and Environmental Affairs (KZN EDTEA)
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts. ***While no permitting or licensing requirements arise directly by virtue of the***	DEA KZN EDTEA

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	proposed project, this section will find application during the BA phase and will continue to apply throughout the life cycle of the project.	
National Water Act (Act No 36 of 1998)	The development also triggers activities that require a Water Use License (WUL) because it crosses several water courses. Therefore, before construction activities may take place, the activity will require a Water Use License as per requirement in the National Water Act (Act No.36 of 1998) (NWA) under Section 21 Water Uses. In terms of the NWA, this development requires a Water Use License for the following water uses: • Section 21(c) impeding or diverting the flow of water in a watercourse and; • Section 21 (i) altering the bed, banks, course or characteristics of a watercourse. ***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).***	Department of Water and Sanitation (DWS)
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas	DEA Local Municipality
National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent » The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. » Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component. ***A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development***	South African Heritage Resources Agency (SAHRA) AMAFA
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA	DEA KZN EDTEA

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011). GNR 598: The Alien and Invasive Species (AIS) Regulations provides for the declaration of weeds and invader plants. ***An ecological study has been undertaken as part of the BA process, as such the potential occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered within this report***.	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated" GN 908 provides a list of protected tree species. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of Forestry Fisheries and Environment (DFFE)
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of Forestry Fisheries and Environment (DFFE)
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel)	Department of Health

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	is prohibited without an appropriate license being in force. ***It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health***	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. ***As no waste disposal site is to be associated with the proposed project, no permit is required in this regard. Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr. The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license***.	DFFE: Chemicals and Waste Management KZN EDTEA: General waste
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. ***An abnormal load/vehicle permit may be required to transport the various components to site for construction.***	Provincial Department of Transport
Conservation of	The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) has	DFFE

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
Agricultural Resources Act (Act No 43 of 1983)	categorised a large number of invasive plants together with associated obligations of the land owner. Invasive plant species that should be removed or maintained only under certain commercial situations are identified in terms of the CARA. This Act will be applicable to the project if and where such plants arise within or adjacent to the project area. Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. ***While no permitting or licensing requirements arise from this legislation, this Act will find application during the BA process and will continue to apply throughout the life cycle of the project.***	
PROVINCIAL		
KwaZulu-Natal Nature Conservation Management Amendment Act, 1997 (No 5 of 1999)	The KZN Conservation Management Amendment Act (1999) provides for the establishment of the KZN Conservation and prescribes its powers, duties and functions which include • Direct Nature management; and • Direct protected areas management ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Environmental Biodiversity Protected Areas Management Bill, 2014	The KZN Environmental Biodiversity Protected Areas Management Bill of 2014 provides for the establishment, functions and powers of the Ezemvelo KZN Wildfire the protection and conservation of indigenous species, ecological communities, habitats and ecosystems, the sustainable use of indigenous biological resources and the declaration and management of protected areas; • Schedule 3, 7 and 8 of includes the lists of protected fauna and flora species. ***The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species. The ecological Impact Assessment is being undertaken to confirm presence of projected plan under the Act, this will guide whether permit is required for the destruction of removal of certain species.***	KZN EDTEA Ezemvelo KZN wildfire (EKZNW)
KwaZulu-Natal Systematic Conversation Plan (KZNSCP, 2012)	The process of conservation planning involves extensive mapping of vegetation types, transformation, species data, ecological processes and threats. ***The proposed development needs to consider the future conservation planning of the area in order to ensure that no conflict in the future land-use will occur.***	Ezemvelo KZN wildfire (EKZNW)

3.3 Guidelines documents and standards

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

- South African National Standards (SANS) 10328 (Methods for environmental noise impact assessment in terms of Nema 107 of 1998);
- The Equator Principles (June 2003);
- Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;
- 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 E4).**

4.1 Purpose of Public Participation

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

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

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 this project.

4.2 Public Participation Undertaken

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

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

(iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
(v) the municipality which has jurisdiction in the area;
(vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
(vii) any other party as required by the competent authority.

- Placing an advertisement in:
  (i) one local newspaper; and
  (ii) in at least one provincial newspaper.
- Open and maintain a register/ database of interested and affected parties and organs of state.

» Release of a Draft EIA Report for Public Review

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

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

4.2.1 Stakeholder and land owner Identification

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

Table 4.1: Key stakeholder groups identified during the EIA Process

Organisation	I&APs type	Designation	First Name Last Name
Department of Environment, Forestry & Fisheries	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
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 13 Cllr	Cllr Absolom Phaphama Mbatha

4.2.2 Stakeholder Database

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

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

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix E8**). While I&APs were encouraged to register their interest in the project from the onset of the

process undertaken by Envirolution Consulting, the identification and registration of I&APs has been on-going for the duration of the BA process.

4.2.3 Placement of Site Notices & Newspaper advertisement

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

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

4.2.4 Written notifications

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

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

4.2.5 Public Review of the Draft Basic Assessment Report

i. Stakeholder:

English and isiZulu Adverts was placed in the local Newspapers notifying registered IAPs of the availability of the draft BAR. The draft BA Report was publicly made available to all registered I&AP's from 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
- 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 E6**.

4.2.7 Comments and Responses Report

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

4.3 Summary of Issues Raised by I&AP's

Issues and concerns raised by I&AP's have been integrated into the Issues and Responses Report. The issues and concerns were raised by means of:

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

5 DESCRIPTION OF THE AFFECTED ENVIRONMENT

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

5.1 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)	836mm
Annual Precipitation Coefficient of Variation (%)	23%
Mean Annual Potential Evaporation (mm)	1 844mm
Mean Annual Temperature (ºC)	16.2 ºC
Mean Frost Days	20

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.

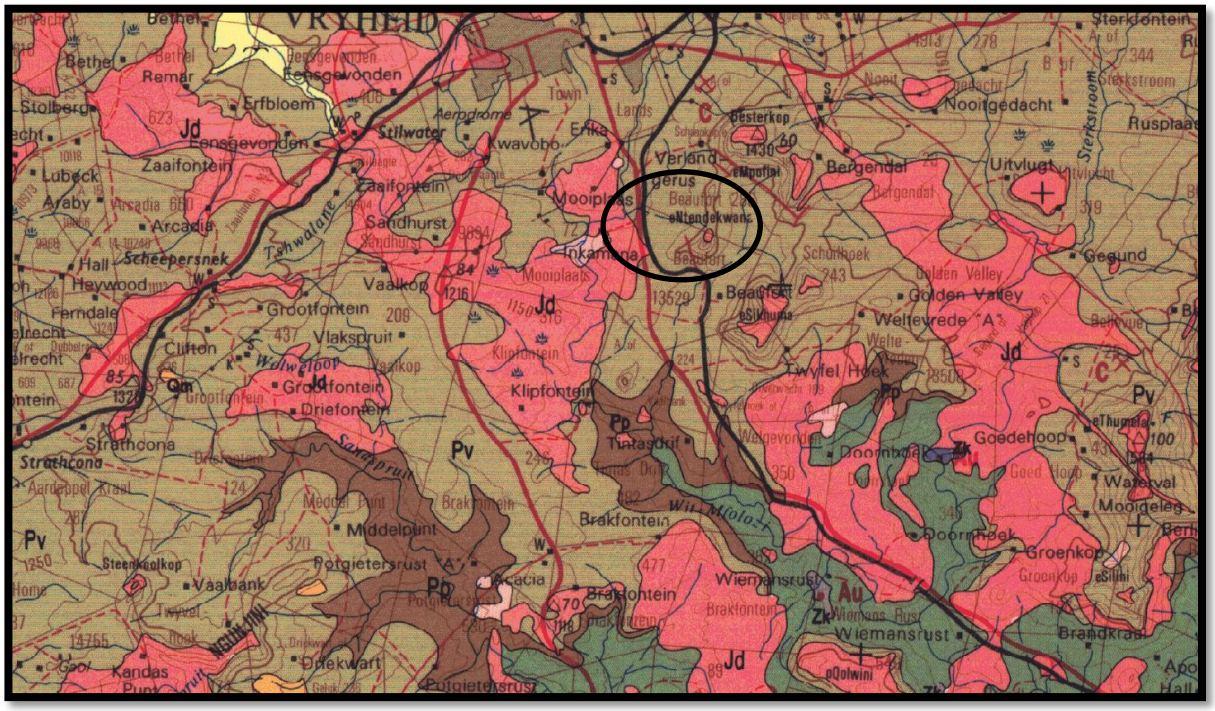


Figure 5.1: Geological Setting of the study area

5.1.3 Soil and Agricultural Potential

The project site falls under the land class type Db137 which comprises of B-horizon soils not red. This layer is lighter brown and holds more water than the topsoil because of the presence of iron and clay minerals. There is less organic material present in the B-horizon. B horizons: are commonly referred to as the subsoil. They are a zone of accumulation where rain water percolating through the soil has leached material from above and it has precipitated within the B horizons.

Included as B horizons, where contiguous to other genetic horizons, are layers of illuvial concentration of carbonates, gypsum, or silica which are the result of pedogenic processes and brittle layers that show other evidence of alteration, such as prismatic structure or illuvial accumulation of clay. 2.4% of soils under the Db137 soil classification can be classified as Rocks and 4.3% of soils can be classified as Mispah (Ms10). The soils have clay content varying between 6% and 55% with the average clay content of the site at 21.5%. The soil depth of the area varies between 100mm and 300mm with the average depth of the site at 526.7mm.

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 and presence of homesteads. Erosion is a major issue around the site area which inhibits agricultural development**.** Although, the area has medium potential for agriculture based on the classification indicated in **Figure 5.2**, the **agricultural value of the area is low** due to lack of commercial agricultural productivity in the area. Therefore, based on the fact that the site has low agricultural productivity level, the land can be utilized for the proposed Vryheid power line construction. The area required (300 m) for constructing the power line will not have significant impact on area available for agriculture.

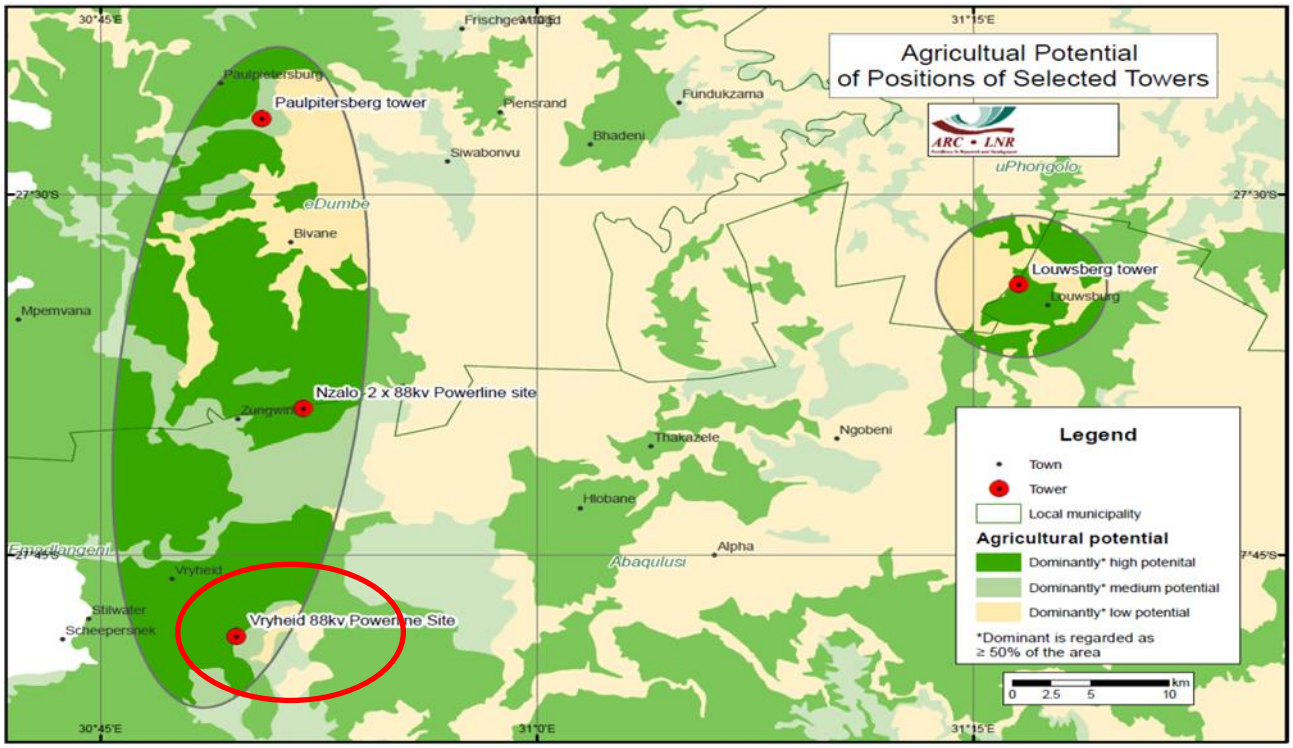


Figure 5.2: Agricultural Potential Map of the Upper Study Area

5.2 Water Resources of the study area

Drainage and River Setting: The Vryheid turn-in powerlines site is located within Quaternary Catchment W21A, near its boundary with W21B. The primary watercourse draining Quaternary Catchment W21A is the upper White Mfolozi River (**Figure 5.3**). The Vryheid turn-in power lines site is on the left-bank side of this river system, which is approximately 2km downslope of the study site. The watercourse network draining the Vryheid turn-in powerlines study area consists of several low order tributaries of the White Mfolozi River, with these water courses flowing in a general westward direction, ultimately discharging flow into the Klipfontein Dam, a local water supply dam along the White Mfolozi.

Wetland Setting: The study area falls within the Sub-escarpment Grassland Group 4 wetland vegetation group. A seep wetland system has been modelled and mapped to occur 150-280m to the west of the present alignment centreline as part of the National wetland Map Version 5 as shown in Figure 4 below. furthermore, two depression wetlands formed in artificial excavations have been modelled and mapped to occur 250-400m to the west of the present alignment. Several small dams also occur within the greater 500m regulated area that have been modelled as depression wetlands as shown in **Figure 5.4**.

Water Resource Management Context: The watercourses within the study area all drain westwards into the Klipfontein Dam located 720m to the west of the powerline alignment. The Klipfontein Dam is a local water supply dam along the White Mfolozi River.

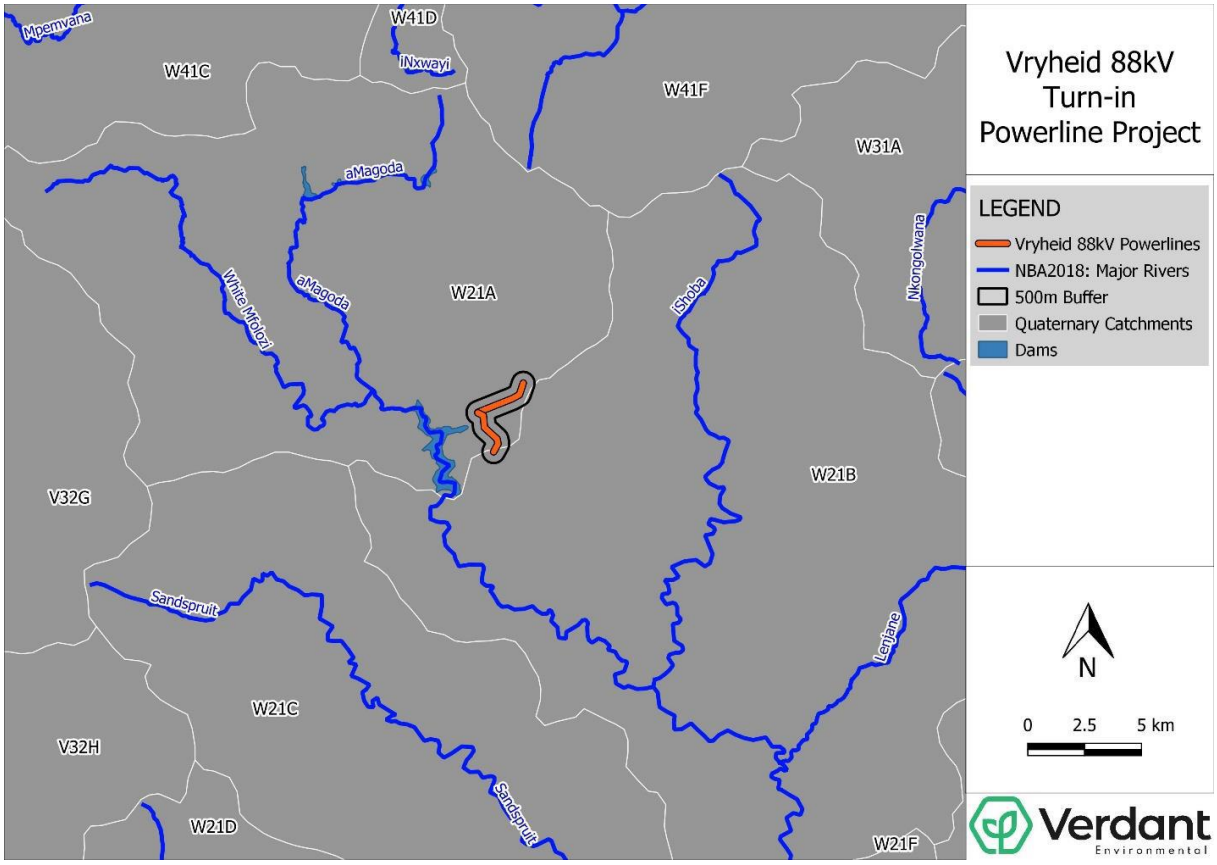


Figure 5.3: Drainage and river ecosystem setting of the study area.

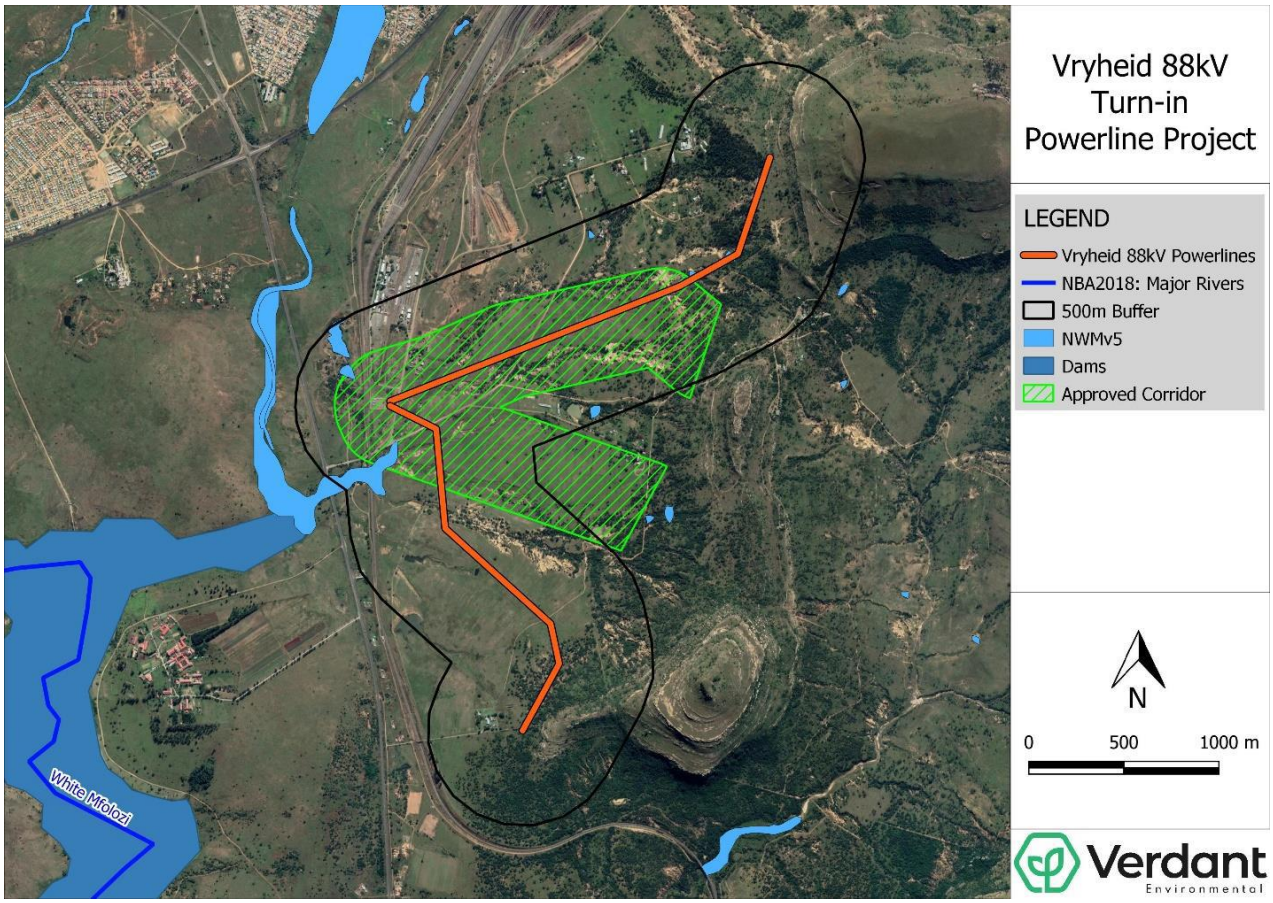


Figure 5.4: Study area in relation to the wetland mapping from the National Wetland Map Version 5

Desktop Mapping within 500m and Confirmation of the Study Area

All the potential watercourses occurring within 500m of the powerline alignments were mapped as shown in **Figure 5.5** below. The proposed powerline alignment crosses and is near several wetland and river units. 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.

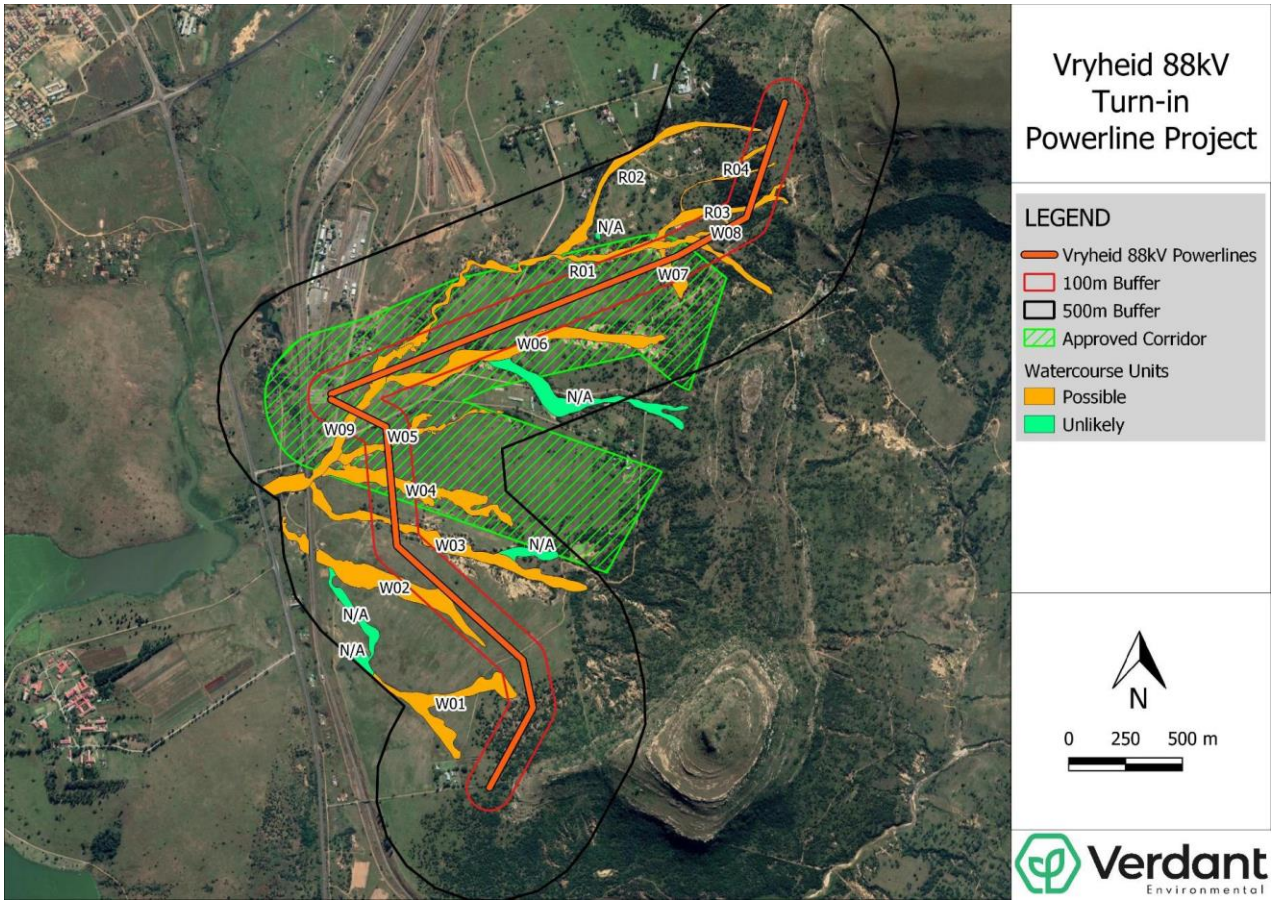


Table 5.5: Watercourses within 500m of the project activities with an indication of the likelihood of impact.

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 Northern KwaZulu-Natal Moist Grassland (Mucina & Rutherford 2006). Vegetation and landscape features are described by the latter as: "Hilly and rolling landscapes supporting tall tussock grassland usually dominated by *Themeda triandra* and *Hyparrhenia hirta*. Open *Acacia sieberiana* var. *woodii* savannoid woodlands encroach up the valleys, usually on disturbed (strongly eroded) sites."

The vegetation type is provided with the conservation status of Least Concern, however, it is also described as being poorly protected with the amount of endemism uncertain (Skowno et al. (2018).

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

- The terrestrial vegetation type of the study area, Northern KwaZulu-Natal Moist Grassland, is currently listed as **Least Concern** in the NBA (SANBI, 2018).
- The sub-quaternary catchment within which the study area is located is a **Fish Support Area**.
- Wetlands within the study area are currently listed as **critically endangered** in the NBA (SANBI, 2018).
- The seep and depression wetlands modelled to occur within the greater 500m regulated area have been classified as **Wetland FEPAs** in the NFEPA Project (CSIR, 2011).
- Northern portions of the study area have been earmarked as Critical Biodiversity Area3: Irreplaceable in the KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015) (**Figure 5.6**).
- A small potion in the south of the study area has been earmarked as Critical Biodiversity Area: Optimal 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 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 2546	Fish Support Area	n/a
	Wetlands	FEPA Wetlands	One (1) FEPA Wetland Present	Eastern edge of the powerline 500m buffer (Figure 10).
		Sub-escarpment Grassland Group 4	Seep Wetlands – Least Threatened Unchanneled Valley-Bottom Wetlands - Endangered	Wetland ecosystem types present within study area noted at site
2018 National Biodiversity Assessment – Inland Aquatic / Freshwater Realm (GIS Coverage)	Terrestrial	Northern KwaZulu-Natal Moist Grassland	Least Concern	Intact grasslands and woodland
	Rivers	North Eastern Uplands, Non-perennial Transitional River	Endangered	River ecosystem type present within study area noted at site.
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning / Threat Status**	**Location in Relation to Project Site**
	Wetlands	Sub-escarpment Grassland Wetland Bioregion	Seep Wetlands - Critically Endangered Unchanneled Valley-Bottom Wetlands - Critically Endangered	Wetland ecosystem types present within study area noted at site
PROVINCIAL AND REGIONAL LEVEL CONSERVATION PLANNING CONTEXT				
Conservation Planning Dataset		**Relevant Conservation Feature**	**Conservation Planning Status**	**Location in Relation to Project Site**
KZN Aquatic Systematic Conservation Plan (EKZNW, 2007)		Planning Unit 861	Available	Entire project site
KZN Terrestrial Systematic Conservation Plan (EKZNW, 2015)		CBA: Optimal	CBA: Optimal	Small portions of the terrestrial / dryland grasslands
		CBA: Irreplaceable	CBA: Irreplaceable	Portions of the terrestrial / dryland grassland in the north

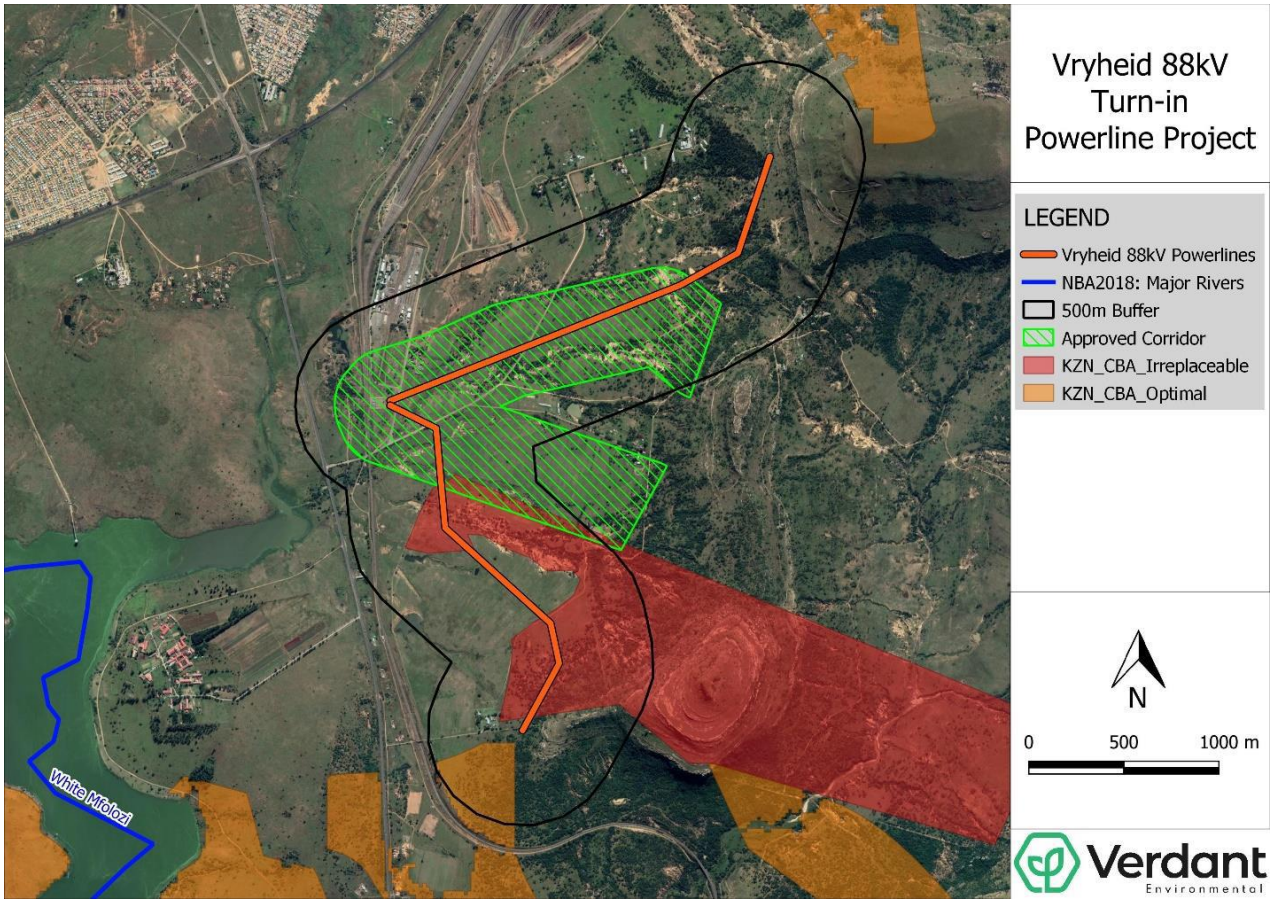


Figure 5.6. KZN terrestrial systematic conservation plan (SCP) CBAs in relation to the study area.

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.

Bloedrivier-Vryheid East 88kV alignment

BVE1 to BVE2: Degraded primary grassland - not part of this assessment

- **BVE2 to BVE3 - Secondary grassland:** This comprises formerly cultivated land and the grassland is Aristida congesta dominated and secondary. The alignment again crosses an eroded drainage line in which only the two Vachellia species occur.
- **BVE3 to BVE4 - Secondary Grassland:** his grassland may formerly have been distantly cultivated, is again Aristida congesta dominated and is nearly secondary. Very few herbaceous species were seen except for ruderals (species which flourish under conditions of disturbance), such as those mentioned above.
- **BVE4 to BVE5** - **Wooded grassland**: The vegetation is wooded grassland. The route follows an existing power line. Vegetation has not been cultivated, but some disturbance has occurred under the pylons. There is a small amount of herbaceous diversity, with the species involved suggesting it was at one time more open grassland. The trees are overwhelmingly comprised of the same pioneer Vachellia species while the unpalatable shrub *Lippia javanica* is common.

Nzalo-Vryheid East 88kV line

NVE1 to NVE3: Secondary grassland - not part of this assessment

- **NVE3 to NVE4 - Wooded grassland and woodland:** The route comprises wooded grassland and woodland. The alignment crosses eroded drainage lines in which the main trees are again pioneer species of Vachellia. There is also some mixing of alien invasive species, principally Acacia mearnsii (Black Wattle) and Lantana camara. There is a very small presence of other, common woody shrubs and trees, such as *Canthium mundianum (Rock Turkey-berry), Clerodendrum glabrum* (White Cat's Whiskers), *Diospyros lycioides subsp. guerkei* (Quilted Bluebush), Grewia occidentalis (Cross-berry Raisin) and Ziziphus mucronata (Buffalo-thorn).

NVE4 to NVE5: Wooded grassland and alien vegetation

- The vegetation comprises wooded grassland and alien vegetation. The route continues to cross erosion lines and gullies. Woody species comprises common, pioneer species mentioned, together with an even greater amount of alien, invasive species. The main trees present are in fact *Acacia saligna* (Wattle) and eucalypts (*Eucalyptus sp*.).

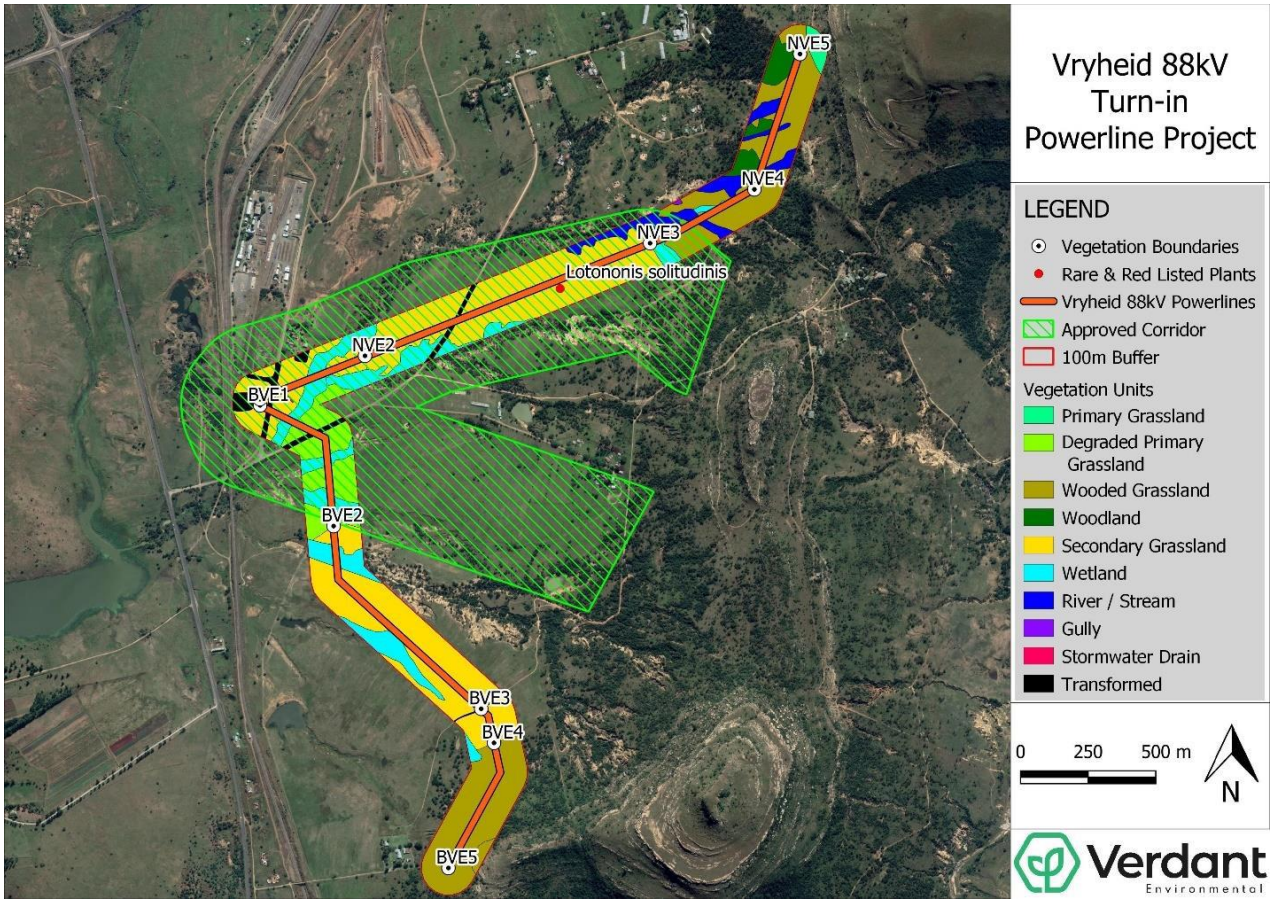


Figure 5.7: Vegetation communities within 100m of the alignments

Threatened and Protected Species: No threatened or protected plants were observed along and in the vicinity of the powerline alignments. However, the following is important to note:

- 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.
- At its closest point, the alignment is within approximately 100 metres of the foothills of a small mountain which due to steep and rocky terrain has never been cultivated and which may have spared from severe grazing impacts. It is possible that one or more species of conservation concern could be found on this mountain.
- There is a mountain to the east which comprises what appears to be good quality vegetation. At its closest point, better quality vegetation on the foothill is approximately 30 metres from the alignment at NVE5. Some species of

conservation concern are recorded from grassland in the Vryheid area (for example *Ceropegia antennifera*). However, these species are very rare and some have not been recorded for decades.

- *Lotononis solitudinis,* a rare species (Van Wyk, B.-E. 1991), was found approximately 35 metres from the alignment at NVE2 to NVE3. It is however not red listed (**Figure 5.8**).

Figure 5.8: *Lotononis solitudinis.*

5.3.2 Fauna

Site Characteristics and Habitat Description: The study area falls within the Grassland Biome4. The majority of the site has flat to gently sloping topography, with the land becoming steeper as the line runs east. The land does not appear to be utilised for commercial purposes; however, evidence suggests the land was cultivated in the past and the land in the vicinity of the Nzalo-Vryheid East 88kV Line is currently used for livestock grazing by the surrounding community, whilst the majority of the land under the Bloedrivier-Vryheid East 88kV Line is currently used for the purposes of a game lodge. In terms of terrestrial fauna, the main habitat units identified onsite, and through aerial imagery, 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, poor grass cover and patches of sparsely vegetated ground, thus reducing the potential of unit to provide habitat to faunal species.
- **Woodland**: Small patches of thicket are present on the hillslopes in the eastern portion of the site.
- **Eroded areas:** A number of severely eroded areas, creating relatively deep gullies, are present within the site.
- **Degraded wetland**: A small, degraded wetland occurs at the westernmost portion of each alignment.
- **Transformed habitat:** Two roads traverse the site.

Figure 5.9: Habitat units present along the proposed the proposed Power Line.

Mammals: Of the 68 terrestrial mammal species known to occur in the region, thirteen are Red List species - seven are listed as Vulnerable, five as Near Threatened, and one as Endangered. None of these species, nor any evidence of these, were noted during the site visit.

Reptiles: According to this dataset, a total of 38 reptile species occur in the region (Appendix E2). Although no reptile species were observed onsite during the site visit, a number of suitable microhabitats for reptiles are present, such as rocks, logs and trees. Of the 38 reptile species known to occur in the area, only one is a Red List species..

Amphibians: A total of 14 amphibian species have been recorded in the region, all of which are classified as Least Concern (Appendix E2). No amphibians were observed during the site visit, though it is likely that they will be present in the dams onsite. Aquatic habitats onsite are, however, relatively limited in extent and it is thus likely that the sites are of limited importance to amphibian species. It must, however, be noted that amphibians appear to be largely under-studied in the area.

Invertebrate Diversity: Although an extensive invertebrate study was not undertaken at the site, it was noted that invertebrate diversity within the site was particularly low, with few specimens observed. Most invertebrates observed onsite were Lepidoptera or Orthoptera. No species of Diplopoda were observed, despite targeted searches for such species.

5.3.3 Avifauna

Although it falls outside of any Important Bird Areas (IBAs), the site is located approximately 20km east of the Grasslands IBA (SA020). This site is considered to be one of the most important sites in the IBA network, and is home to a range of bird species, including the endangered White-winged Flufftail (Sarothrura ayresi)19. An avifaunal specialist study conducted at the site in 2019 indicated that a total of 339 avifaunal species have been recorded within

the region. A number of bird species, including White-Fronted Bee-Eater (Merops bullockoides) and Green Wood Hoopoe (Phoeniculus purpureus), were observed onsite. Of the 339 avifaunal species known to occur in the region, 20 are Red List species - two are Critically Endangered, five are Endangered, eight are Vulnerable and five are Near Threatened. During the site visit a single Secretarybird (Sagittarius serpentarius) was observed in the grassland area in the Bloedrivier-Vryheid East 88kV Line (Figure 5). The conservation status and likelihood of occurrence of the Red List species on site is presented in **Table 5.3**. Please note all information is drawn from the 2019 avifaunal specialist study.

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

Species	Common name	Conservation Status	Occurrence in study area
Lioptilus nigricapillus	Bush Blackap	Vulnerable	Unlikely
Neotis denhami	Denham's Bustard	Vulnerable	**Possible**
Anthropoides paradiseus	Blue Crane	Near Threatened	**Possible**
Balearica regulorum	Grey Crowned Crane	Endangered	**Possible**
Bugeranus carunculatus	Wattled Crane	Critically Endangered	Unlikely
Stephanoaetus coronatus	African Crowned Eagle	Vulnerable	Unlikely
Polemaetus bellicosus	Martial Eagle	Endangered	**Possible**
Aquila verreauxii	Verreaux's Eagle	Vulnerable	Unlikely
Falco biarmicus	Lanner Falcon	Vulnerable	**Likely**
Falco vespertinus	Red-Footed Falcon	Near Threatened	**Likely**
Circus maurus	Black Harrier	Endangered	Unlikely
Geronticus calvus	Southern Bald Ibis	Vulnerable	**Likely**
Alcedo semitorquata	Half-Collard Kingfisher	Near Threatened	Unlikely
Eupodotis senegalensis	White-Bellied Korhaan	Vulnerable	Unlikely
Circus ranivorus	African Marsh Harrier	Endangered	Unlikely
Rostratula benghalensis	Greater Painted-Snipe	Near Threatened	Unlikely
Coracias garrulus	European Roller	Near Threatened	Unlikely
Sagittarius serpentarius	Secretarybird	Vulnerable	**Definite**
Torgos tracheliotos	Lappet-Faced Vulture	Endangered	Unlikely
Gyps africanus	White-Backed Vulture	Critically Endangered	**Possible**

5.4 Heritage Aspects and Palaeontology of the area

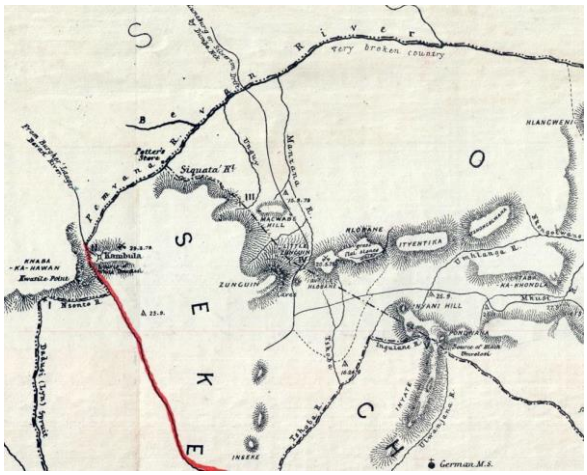
5.4.1 Heritage aspects Overview of the region

The cultural landscape qualities of the larger region essentially consist of two components. The first is a rural area in which the human occupation is made up of a limited pre-colonial element (Stone Age and Iron Age) component. The second component is a farming landscape dating to the colonial period, which, over time also gave rise to an industrial landscape (coal mining). Unfortunately, not much research has been done on the prehistory (Stone Age and Iron Age) in the region. References are made to the occurrence of sites dating to all the phases of these two periods in the larger region (e.g. Anderson 2015).

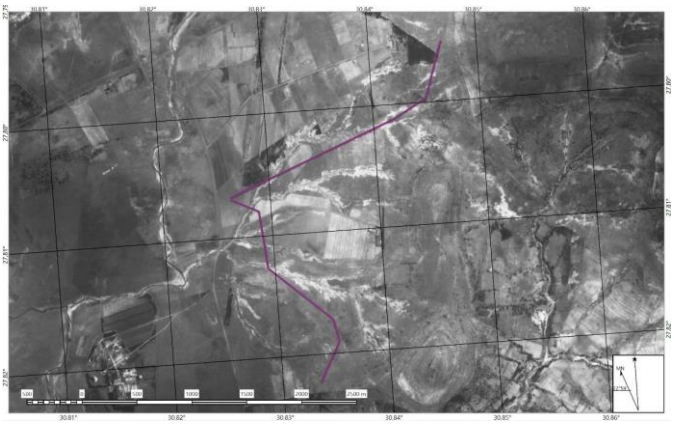
The town of Vryheid was established in November 1884 as the capital of the Nuwe Republiek (New Republic). This republic was established as a direct result of the Anglo-Zulu War. As a consequence of this latter war the larger region experienced a troubled time with different Zulu leaders trying to assert their power over each other. During the Second South African War (1899-1902) a number of battles took place in the region, e.g. at Lancester Hill and at Holkrans some distance to the north of the study area. At the latter site 56 republicans were killed during a surprise attack by the Zulu.

The larger Vryheid region soon became known for its rich and extensive coal fields, which have been exploited for more than 100 years. For some time, the coke-ovens at Vryheid Coronation Mines The railway line running from Vryheid eastwards via Hlobane was completed in 1909 and mainly served the various coal mines in the region. A shorter branch line used to split off at Boomlaer, west of Hlobane, running in a south-eastern direction to serve a number of mines. However, this section of the line has been dismantled for some time now, with only the old railway bed remaining held the record of being the largest such ovens in the southern hemisphere.

From a study of old maps and aerial photographs (**Figure 5.10**) is can be seen that little development took place in the larger region. Some of the earliest development shows roads and tracks and, later, some “farm labourer” homesteads, as well as agricultural fields. Over time an increase in the number of the homesteads can be seen.



Section of the map “Zululand” (1879) showing the larger project area



Aerial view of the project area dating to 1961

Aerial view of the project area dating to 2011

Aerial view of the project area dating to 2021

Figure 5.10: Site specific review

5.4.2 Palaeontological overview of the area

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

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

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

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

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

5.5 Visual Characteristics of the area

5.5.1 Topography

The natural topography is considered varied, ranging between undulating plains and mountainous terrain with a couple of prominent hills forming the northern and eastern periphery of the study area. A general downward slope exists from the north towards the south. 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 Wit-Mfolozi River and Besterspruit drains into the Klipfontein Dam, west of the R34.

The topographic variation consists of fairly large mountains in the northern region and individual hills east of the project site before levelling out into an undulating plain towards the south. The mountains and hills provide variation in the scene and due to their largely natural condition supports a pleasant scenic quality. The Mpofini Game Lodge makes use of the scenic

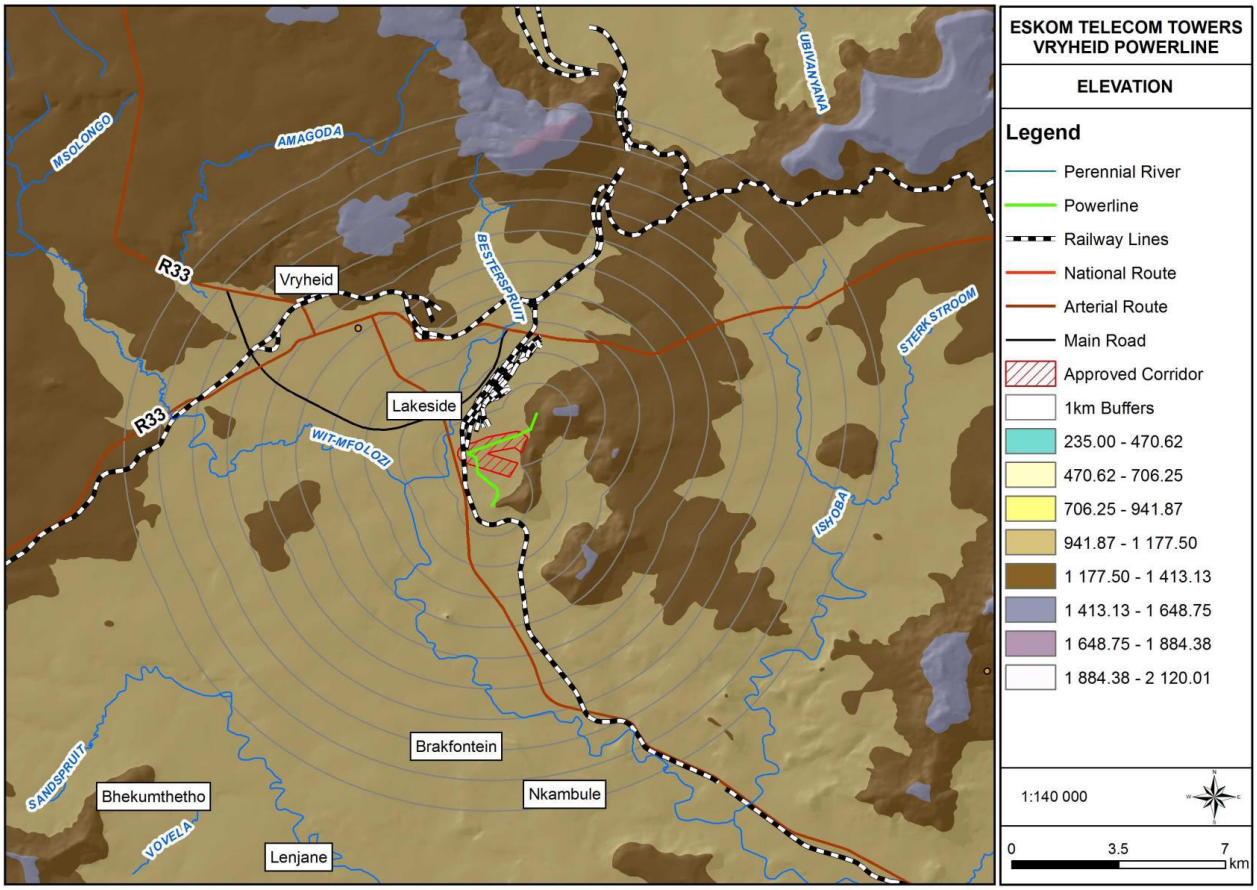


Figure 5.11: Regional elevation map

Another topographical feature that adds visual value to the study area is the Klipfontein Dam, west of the proposed powerlines. It is a relatively sizable waterbody which attracts tourists and outdoor activities to the area. It is situated in the higher catchment area of the Wit-Mfolozi River which eventually drains into the Indian Ocean at St Lucia.

The powerlines will be located on the low laying areas between the R34 and the hills to the east. According to the viewshed analysis (**Figure 5.12**), the hills are effective in containing the Zone of Visual Influence by blocking most of it towards the east. The topography is more open towards the west and south. The topography is expected to provide a medium screening potential.

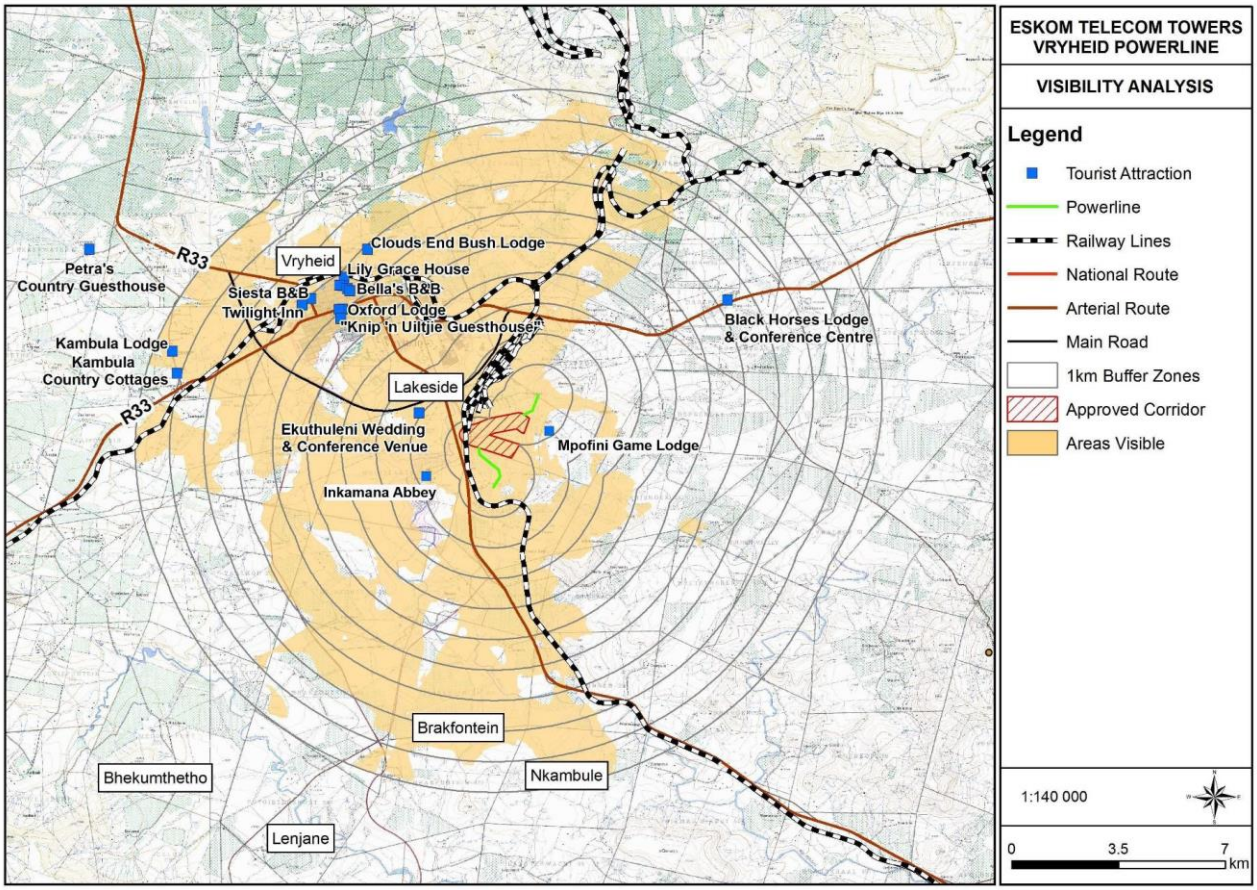


Figure 5.12: Cumulative viewshed map

5.5.2 Land use and Landcover

The study area falls within the Northern KwaZulu-Natal Moist Grassland vegetation type (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2012)) which consists mostly of grassland species on the low laying areas and trees and shrubs along streams, rivers and mountain sides.

The natural landscape has been transformed to some extent through human development along the outskirts of the town. The study area is located in the peri-urban zone south of the town of Vryheid. This is considered a transitional zone between the urban and rural areas. It is located approximately 2.5 km south of the most southern extension of Vryheid (Bhekuzulu and Lakeside) and features a couple of small farms and agricultural holdings. A small rural community is wedged between the R34 and the railway line. Farmsteads are arranged along a sparse dirt road network (D503) extending into the area between the railway line and the hills along the eastern periphery of the study area. The Mpofini Game Lodge is situated on the eastern slope of one of the hills, east of the study area, but access is gained via the D503.

The Klipfontein Dam is one of the largest man-made structures in the study area and contributes to a pleasant scenic view. The Inkamana High School is located on its eastern banks, west of the R34 and forms part of Inkamana Abbey. It has a pupil count of approximately 200 with boarding facilities. It was founded in 1922 as a missionary station and is still functional today. The R34 provincial road passes through the study area and connects Vryheid to Ulundi and other settlements to the south. It forms part of the Rainbow Route which connects Mpumalanga and Kwazulu Natal via a scenic meandering path through numerous towns as well as cultural and heritage sites.

The Vryheid East train station and shunting yard is also part of the study area's baseline. It occupies a sizable area in the south eastern quadrant of the R34 an R69. It consists of a denser network of railway lines and a couple of sheds which adds an industrial character to that part of the study area.

Two existing 88kV powerlines traverse the study area. The one crosses the study area along the southern edge of Lakeside and Bhekuzulu settlements. The other powerline sweeps along the foot slopes of the hills east of the proposed powerlines. The proposed powerlines will connect to this particular 88kV line at two different locations. From here it will join at the existing substation near the D503 T-junction with the R34.

The study area is mostly considered rural, with natural or semi-natural vegetation dominating the surface cover. In some areas significant transformation has occurred for example the Transnet railway station which promotes a localised industrial character. The Klipfontein Dam is another anthropogenic feature which contributes positively to the scenic quality. The mountains provide elevational definition to the landscape and are features of interest, further contributing to pleasant panoramic views, although not unique. 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 rural character and natural or semi-natural vegetation cover, although it varies between the different land uses as described above. Transnet railway station is more industrial in nature and contrasts with a rural character. In addition, the R34 and existing power infrastructure promotes a peri-urban sense of place. However, the mountain provides a picturesque backdrop and creates pleasant scenes attributed to clean ridgelines, cliffs, and mountain vegetation.

5.5.4 Viewshed Analysis

Several views were assessed during the site investigation as illustrated in **Figure 5.13.** 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 5.12**).

The conclusion is that the study area's topography provides a reasonable degree of screening and contains most of the powerlines' visibility towards the east. The topography is more open towards the north, west and south, and visibility extends further into this area, although fragmented. However, the landcover, for example 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 5.13**

- Panoramic view (1): This photo is taken from the crossing between the R69 and R34, 1,7km north of the proposed powerlines. It is representative of views from Lakeside and Bhekuzulu. Note the panoramic views that comprise of distant mountains and a rural setting, but is somewhat blemished by the powerlines and road infrastructure in the foreground;
- Panoramic view (2): This photo represents a view from the dirt road (D503) on the way to Mpofini Game Lodge. The proposed power lines will pass through this landscape which is predominantly grassland and small trees. Residents in this area will experience an interruption to their existing views, overlooking the rural landscape;
- Panoramic view (3): This panoramic view is taken from the R34 at the most southern point of the proposed powerlines. It illustrates the view of the small rural community between the railway line and the R34. Their views towards the mountains will be impacted with the addition of more powerlines.

Panoramic view (1)

Panoramic view (2)

Panoramic view (3)

Figure 5.13: study area photographic record

5.6 Social Characteristics of the Study Area and Surrounds

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, Bhekuzulu, 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 5.14 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.

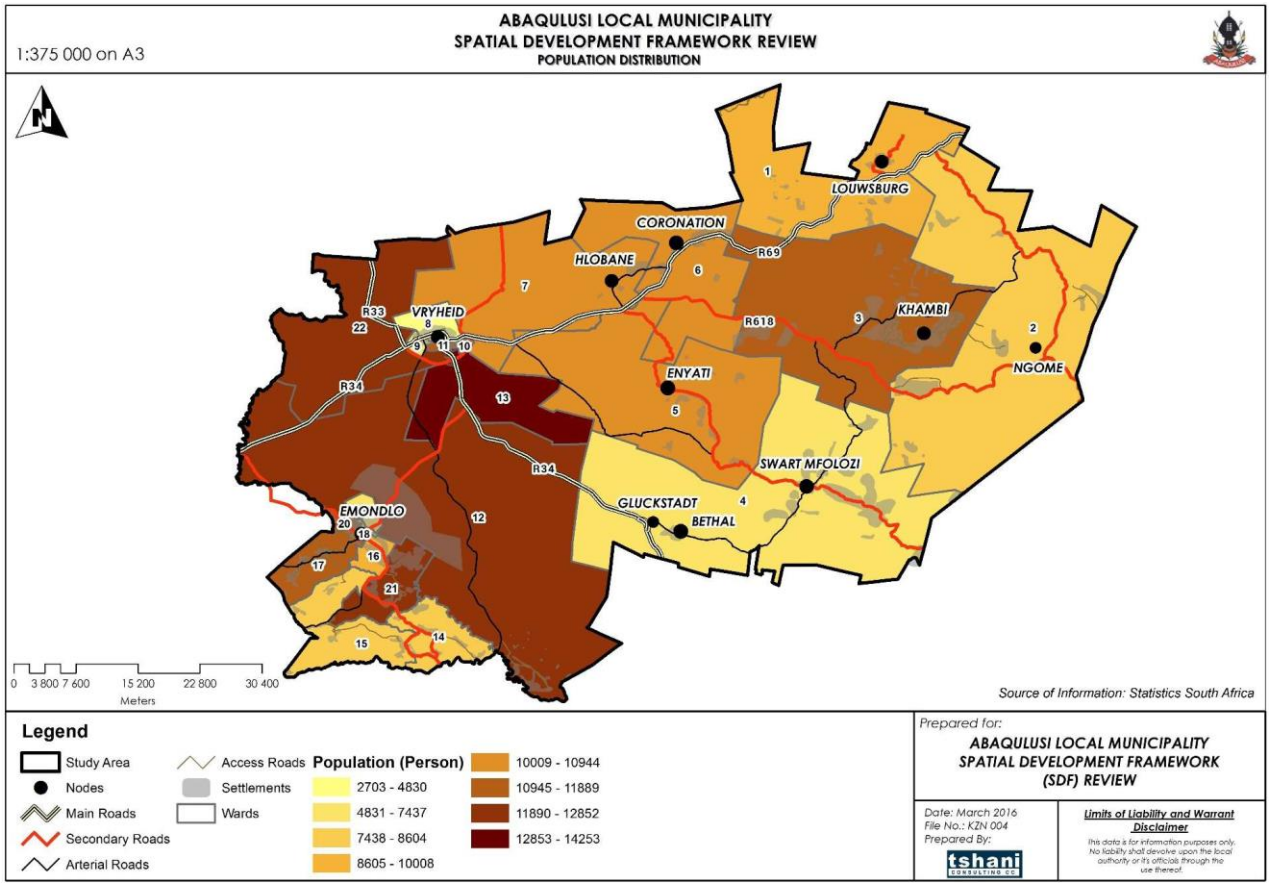


Figure 5.14: Abaqulusi Local Municipality Population

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

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 Forestry, Fisheries and Environment guide on assessing cumulative effects[3] 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 100m 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 section 4.1 of Appendix 1 of this report. **Only the listed watercourse units below form part of this assessment, the rest are part of an authorised area.** The location and extent of the delineated watercourses at the Vryheid turn-in powerline site are shown on the map in **Figure 6.1**.

- R01 – Transitional river
- R02 – Mountain stream
- R03 – Mountain stream
- R04 – Mountain stream
- W01 – Seep wetland
- W02 – Seep wetland
- W03 – Seep wetland
- W08 – Seep wetland
- W09 – Seep wetland

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

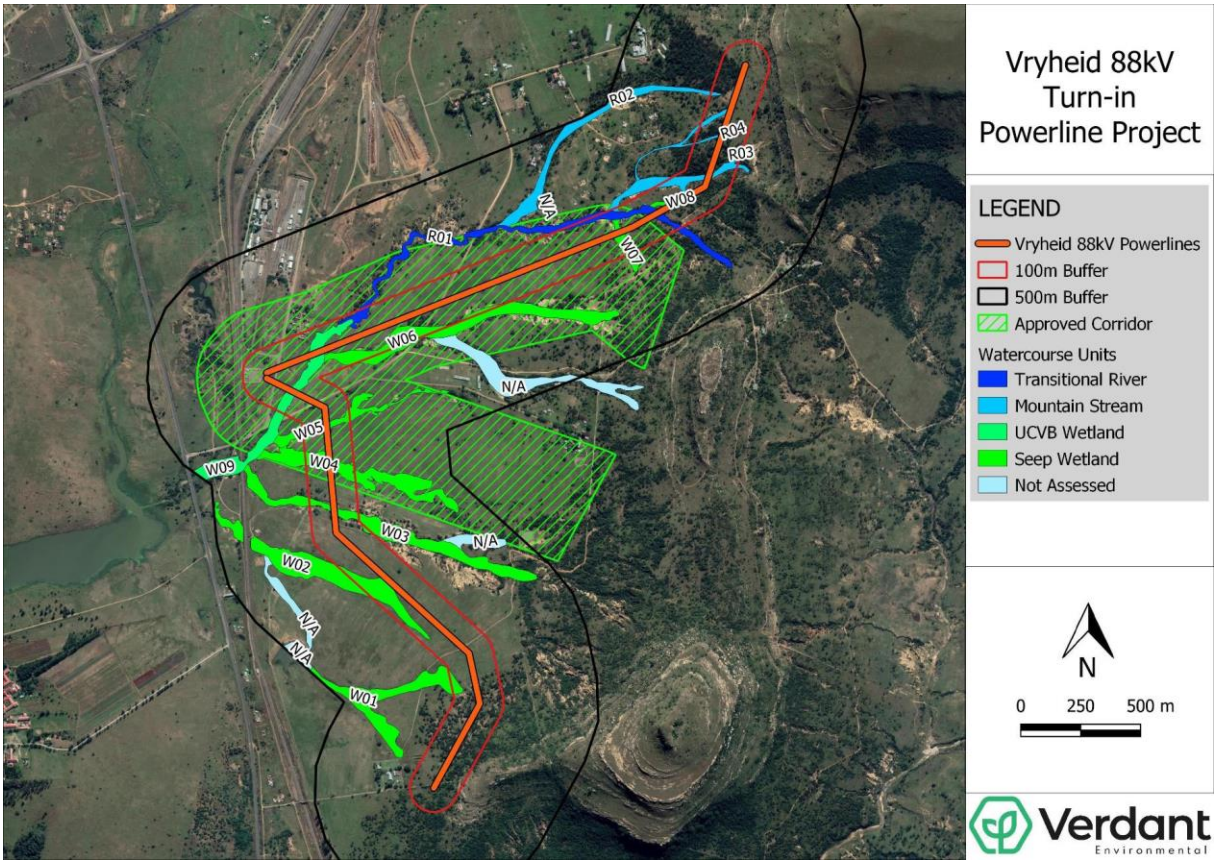


Figure 6.1: Location and extent of the river and wetland units delineated within 100m of the powerline alignments.

Present Ecological State (PES) Assessment

An IHI assessment was completed for **river units** VRY R01, VRY R02, VRY 03 and VRY 04. River Units VRY R01, VRY R02, VRY R03 and VRY R04 have all experienced substantial erosion, with these units being incised, often to as deep as 10-15m at certain locations. These units are **highly degraded** with limited natural vegetation and processes remaining in their current state.

The **wetland PES** assessment process placed wetland units VRY W01, VRY W03, VRY W04 and VRY W06 to in the '**D: Largely Modified'** ecological category. Wetlands VRY W02 and VRY W05 were placed in the 'E: Seriously Modified' ecological category. For each assessed wetland, the dominant driver of poor ecological condition is altered catchment runoff processes associated with extensive historic agriculture. Increased runoff volumes and regimes because of reduced basal cover during periods when commercial agriculture dominated the study area likely induced incision along the assessed watercourses. Overtime the erosional processes within the onsite wetlands resulted in the formation of deep gullies. These are now largely stable, with vegetable having established itself within the gully beds. The geomorphic and hydrological processes of the onsite wetlands have however been irreversibly changed.

Ecosystem Services (Functional) Assessment

The **unchanneled valley-bottom wetland unit (VRY W09)** was rated as being of '**very high'** importance for sediment trapping due to its broad, well-vegetated nature, and the dominance of diffuse flow along the wetland, which typically result in efficient sediment trapping capabilities. Additionally, the accumulation of sediment within

the onsite wetlands places them well to provide phosphate assimilation services, with phosphates being known to be readily absorbed by fine sediment particles which accumulate in wetland features. VRY W09 was rated as moderately high for biodiversity maintenance. This rating is driven by the 'endangered' ecosystem conservation status assigned to unchanneled valley-bottom wetlands in the sub-escarpment grassland bioregion according to the SANBI (2018) national biodiversity assessment (NBA). The degraded nature of this wetland unit does however mean that it is playing limited role in contributing to meeting national ecosystem conservation targets in its current state.

Ecological Importance & Sensitivity (EIS) Assessment:
The **low EIS ratings for VRY R01, VRY 02, VRY 03 and VRY 04** were driven by the lack of important or sensitive biota, and low importance of the units for supporting ecological processes given their degraded state.

Wetland Unit VRY W09 was assessed as being of 'High' EIS and the most important wetland unit within the study area. This score is driven by the sediment trapping capabilities of this unit, as outlined in wetland ecosystem services assessment. Wetland units VRY W03, W04, W05, W06, W07 and W08 were each assessed as being of 'Moderate' EIS, while VRY W01 and W02 were assessed as being of 'Moderately Low' EIS. These rating were again driven by each wetland's functional importance in the context of the landscape, with the most importance service provided being sediment trapping. Given the degraded state of each of the assessed wetlands, they were rated as having limited biodiversity maintenance importance, and are not considered to be ecologically sensitive.

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:
Although there are nine (9) watercourses crossing proposed, if proper environmental planning is implemented and pylons are placed to avoid all watercourses and areas sensitive to erosion, the impacts in terms of degradation in the provision of regulating ecosystem services that support freshwater water resources management, disaster management and climate adaptation should be low and the project should be acceptable. 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 recommended 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
Aonyx capensis	African Clawless Otter	Near Threatened
Crocidura mariquensis	Swamp Musk Shrew	Near Threatened
Anthropoides paradiseus	Blue Crane	Vulnerable
Balearica regulorum	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 instream wetlands. However, considering the present alignment and the highly degraded nature of the wetlands, the direct impacts (section 6.1.4) on such species is still considered of 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.**

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

Results of the Vegetation Study:

The Nzalo-Vryheid East 88kV alignment is not considered to impact on important vegetation or species. At its closest point, the alignment is within approximately 100 metres of the foothills of a small mountain which due to

steep and rocky terrain has never been cultivated and which may have spared from severe grazing impacts. It is possible that one or more species of conservation concern could be found on this mountain. The scope of work will then need to be expanded and more time allowed to investigate this and completed earlier in the summer window. However, such an expansion in scope is probably not justified given that construction will occur approximately 100 metres away from better quality vegetation.

The Bloedrivier-Vryheid East 88kV alignment is not considered to impact on important vegetation or species. Most of the vegetation is degraded to severely degraded. However, there is a mountain to the east which comprises what appears to be good quality vegetation. At its closest point, better quality vegetation on the foothill is approximately 30 metres from the alignment at NVE5. Construction must therefore be carefully controlled to minimize disturbance. Some species of conservation concern are recorded from grassland in the Vryheid area (for example *Ceropegia antennifera*). However, these species are very rare and some have not been recorded for decades such species should only be searched for earlier in the summer, preferably after grassland has burned off the winter or early spring before.

Considering the above, the fair condition wooded grassland on the mountain slopes with higher levels of species richness, more natural species composition and higher presence of species of conservation concern was assessed as being of moderate EIS. The secondary grassland between NVE2 to NVE3 was also assessed as being of moderate EIS due to hosting a rare forb species, *Lotononis solitudinis* (Van Wyk, B.-E. 1991); however this section of the line is not part of this assessment.

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
BVE1 to BVE2: Degraded primary grassland	Low
BVE2 to BVE3: Secondary grassland	Low
B4E3 to BVE4: Secondary Grassland Low	Low
BVE4 to BVE5: Wooded grassland	Low
BVE4 to BVE5: Wooded grassland on mountain slopes	Moderate
NVE1 to NVE2: Secondary grassland	Low
NVE2 to NVE3: Secondary grassland	Moderate
NVE3 to NVE4: Wooded grassland and woodland	Low
NVE4 to NVE5: Wooded grassland and alien vegetation	Low
NVE4 to NVE5: Wooded grassland on mountain slopes	Moderate

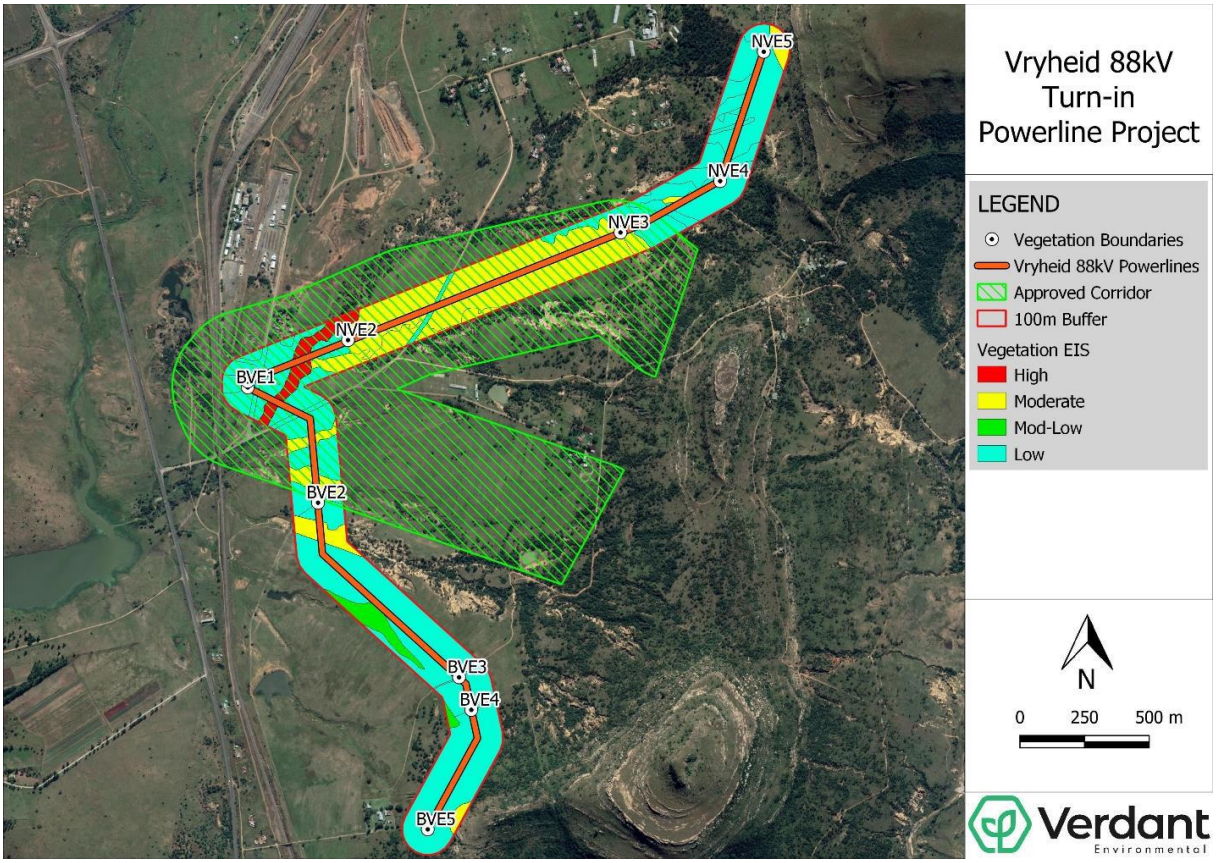


Figure 6.2: EIS map for vegetation occurring within 100m of the powerline alignments.

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
Nzalo-Vryheid East 88kV Line	
Degraded grassland	Low
Woodland	Medium
Eroded area	Low
Degraded wetland	Medium
Transformed habita	Low
Bloedrivier-Vryheid East 88kV Line	
Degraded grassland	Medium
Woodland	Medium
Eroded area	Low
Degraded wetland	Medium
Transformed habita	Low

Figure 6.3: Habitat sensitivities, based on terrestrial faunal sensitivity, for the 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 incudes habitat loss impacts, biota fatalities and population reductions, habitat fragmentation, habitat patch size reduction, and the occurrence of barriers to propagule and animal movement.
- **Indirect ecosystem disturbance impacts** – This impact refers to the indirect impacts to the biota and vegetation communities as a result of activities within close proximity that result in the following impacts: (i) alteration of abiotic soil and moisture conditions, (ii) increased rates of erosion and sedimentation, (iii) alteration of the chemical and biological characteristics of soil and water, (iv) increased alien invasive plant invasion, (v) noise pollution, (v) vibrations and (vi) light pollution, and (vii) expanded edge effect.

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:

- White-Backed Vulture – Critically Endangered
- 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
- Red-Footed Falcon – Near Threatened

The impact summary: Considering the nature of the surrounding habitat and land uses with secondary and degraded primary grassland, wooded grassland and woodland, large, wooded gullies with instream wetlands, adjacent mountains, most of the above-listed bird species are at risk. 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 wetlands, grasslands and the agricultural fields. In addition, Martial Eagles and White-backed Vultures are also likely to be at risk considering the grassland dominated landscape where towers could become preferred nesting sites, particularly since the towers are located relatively close to mountains slopes that are likely flyways for large raptors that use ridge-lift - where air is forced upwards by a slope. Nesting on the towers also 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 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 White-backed Vultures (critically endangered), Martial Eagles (endangered) and Grey Crowned Cranes (endangered), as well as several birds listed as vulnerable. Small reductions in the local populations of these bird species are predicted in the long-term. The risks to the critically endangered white backed vulture of powerline collisions is predicted to be low considering the nature of the surrounding land uses (i.e. Vryheid Town) and the fact that the powerline avoids the mountain slopes that raptors would likely use ridge-lift. However, with their long-wing spans, vultures are at high risk or electrocution at pylons / towers if such a poorly designed and don't include bird friendly designs.
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 for construction 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 significant 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 78% decrease in mortality rates on marked lines (Smallie, 2017 from Barrientos *et al.* 2011).

- The powerline avoids mountains lopes that generate ridge lift that are used by raptors and large birds.
- The proposed powerline is relatively short in length.

6.3 Issue: Risk of impact on Heritage & Cultural Resources

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**.

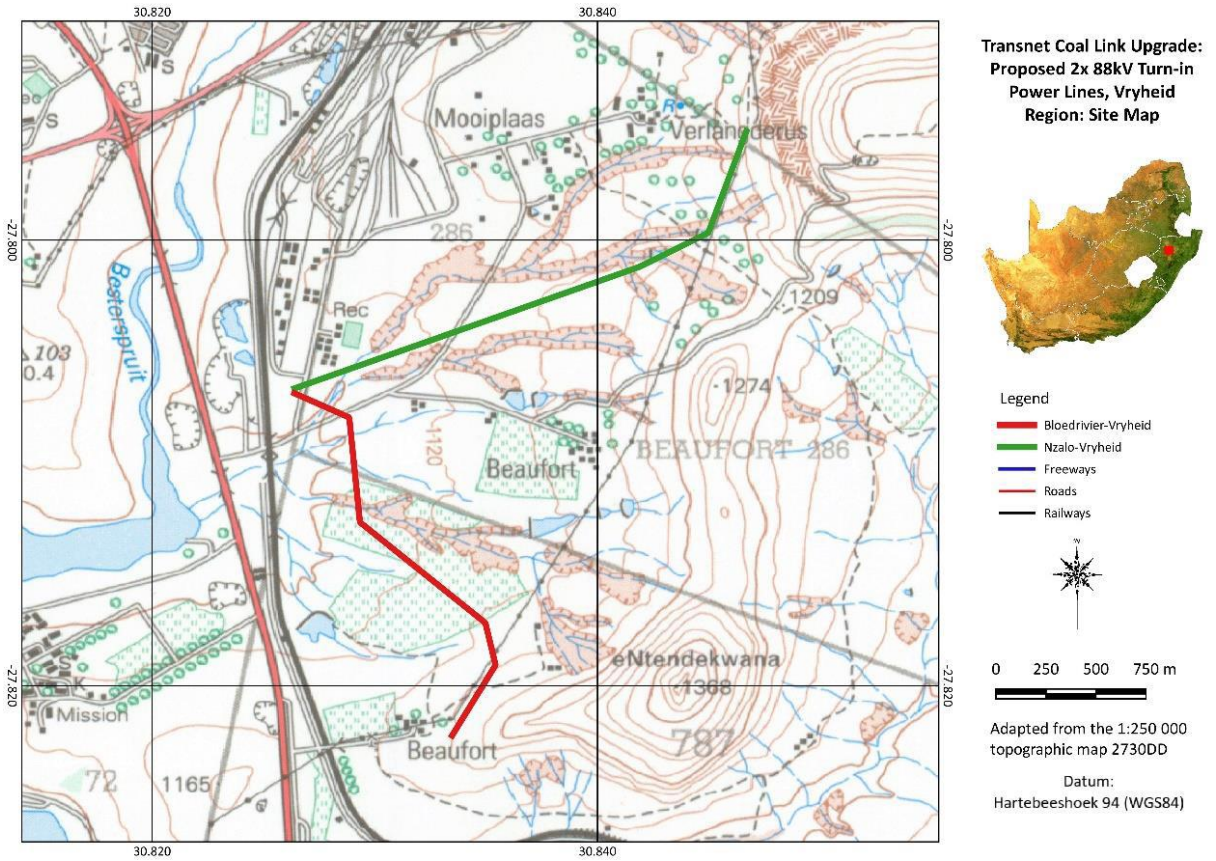


Figure 6.4: Identified features identified in the project area

Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified in the project area.

Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

Historic period

No sites, features or objects of cultural significance dating to the historic period were identified in the project area.

Results of the Paleo Study

The Ecca Group, Vryheid Formation may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009).

Glossopteris trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

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

Table 6.1: Taken from Palaeotechnical Report (Groenewald 2012) (**1cA)**.

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

Table 6.2: Criteria used (Fossil Heritage Layer Browser/SAHRA) **(1cB)**:

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

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

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

Paul-Pietersburg tower – Vryheid Formation, Dolerite.
Vryheid north – Dolerite, Pietermaritzburg Formation.
Louwsberg 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 (AMAFA Palaeotech).**

The threats are:-

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

6.4 Visual Impact Issues

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

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

Tourists are generally classified as observers with a high sensitivity when their reason for visiting the area is focussed on enjoying the visual quality and engaging in outdoor activities that are offered by the study area's natural landscape. Mitigating factors can reduce the sensitivity of the tourists for example screening elements or distance away from the source of impact. A number of tourist attractions and outdoor activities are hosted in the area, in particularly fishing and birdwatching at the Klipfontein Dam and Ekuthuleni Wedding and Conference Venue. Game viewing and hunting are hosted at the Mpofini Game Lodge which is the nearest to the proposed projects. None of the above locations are within the ZMVE except the Mpofini Game Lodge. Topography and vegetation will offer partial screening from the lodge and internal roads which will cause a reduced sensitivity on the part of the tourist. It can be concluded that tourist observers will have a **medium** sensitivity. Viewer incidence is expected to be low.

Residents in the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. Residents in the ZMVE are limited to the rural communities living on the few agricultural holdings and small farms within 1km from the proposed power lines. These will have a **high** sensitivity. Residents from Lakeside and Bhekuzulu, as well as from Inkamana Abbey, are outside the ZMVE and will have a reduced visual exposure due to their distance from the source of impact and the screening effect of trees etc. Their sensitivity is expected to be **medium**. Viewer incidence is expected to 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 limited to road users of the R34 and R69. Intermitted views and a brief exposure to the proposed powerlines are expected as motorists travel through the study area. Viewer incidence is expected to **be medium**.

Sensitivity of the Landscape Character:

The study area is considered to have a medium degree of VAC. Topographic screening in conjunction with tall vegetation limits views on the eastern side of the proposed powerlines. Towards the North West and south, visibility can extend to 10km, although elevation variance and vegetation creates a fragmented visibility pattern that can be described as partial visibility. 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 north, west and south, thereby reducing the ZVI. Within the ZMVE, visibility will largely be influenced by localised trees screening the powerlines from the farmsteads.

A low degree of inter-visibility between adjacent landscapes are expected due to the topographical screening on the eastern periphery. Inter-visibility will however occur towards the north, west and south but due to the distance factor, it will be limited.

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 pleasant scenic qualities of the study area, medium value landscape attributes for example undeveloped mountains and Klipfontein Dam. 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
- Impact on Tourism
- 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 being imported from other provinces. The construction process and associated equipment and material required are shown in **Figure 6.5**.

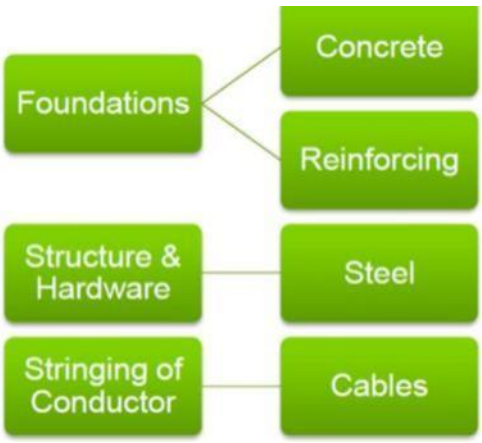


Figure 6.5: Construction transportation process

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 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).	**Direct Impacts:** Impacts to Water Resource Quality and Quantity **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. **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.	**MEDIUM**	• 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: o Crossing points should be aligned along areas or corridors of existing disturbance e.g. along existing road crossings. o 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 access roads.	**Direct Impacts:** Impacts to Freshwater Ecosystem Conservation **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. **Cumulative Impacts:** Pollution of instream aquatic, riparian and/or wetland ecosystems due to the mishandling of hazardous substances and/or improper	**MEDIUM**	• **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. • 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.	**LOW**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
	maintenance of machinery during construction e.g. oil and diesel leaks and spills.		• 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.	**Direct Impacts:** Impacts to Freshwater Species Conservation; **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. **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.	**LOW**	Same as above	**LOW**
OPERATIONAL PHASE IMPACTS				
Functioning of all	**Direct Impacts:**		• It is the applicant's responsibility to ensure the proper functioning of all powerline and	

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
powerline and service road infrastructure	• 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. • Wetland avifauna fatalities. **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. **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.		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 the landowner/developer to control IAPs on their property. • It will be important that long-term monitoring of the potential freshwater ecosystem impacts be undertaken to proactively to identity 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: o Erosion and/or sedimentation in the wetland / river downslope of pylons. o Erosion and/or sedimentation in the wetland / river upstream and downstream of service road crossings and powerline crossings. o Presence of alien invasive plants. o Powerline bird mortalities at river crossings.	

7.2.2 Terrestrial ecological: Impact Assessment

The **table 7.2** below list the activities that could impact on the Fauna 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 ecological 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)
Soil and vegetation clearing and landcover disturbance during construction for • 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.	**Direct Impacts:** *Impacts to terrestrial vegetation communities and habitat:* • Destruction and modification of primary and secondary grassland **Indirect Impacts:** • Erosion and/or sedimentation of primary and secondary grassland due to • Pollution of primary and secondary grassland **Cumulative Impacts:** Degradation of primary grassland type and less representative grassland for meeting conservation targets.	**MODERATE-LOW**	• The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved. • The distance between of the powerlines and pylon / tower sites and the mountain slopes with good condition wooded grassland must be maximised as far as practically possible. • The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved. • Prior to the commencement of any construction activities, the **following features** must be **staked out by a surveyor and demarcated** using brightly coloured shade cloth: o Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. o The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. o The outer edges of the entire construction corridor / right-of-way. • Refer to **section 7of Appendix E2** for **general mitigations** on o 7.1.1. Powerline Alignments and Pylon Siting o 7.1.2. Powerline Access and Service Roads o 7.2.1. Powerline Access and Haulage Roads o 7.2.3. Demarcation of 'No-Go' areas and construction corridors o 7.2.4. Method Statements for working in primary grasslands o 7.2.10. General rehabilitation guidelines o 7.2.11. Construction phase monitoring measures	**LOW**
Establishment of • Pylon	**Direct Impacts:**		• The distance between of the powerlines and pylon / tower sites and the mountain slopes with good condition wooded grassland must be maximised as far as practically	

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
• Access road • Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads	*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 **Indirect Impacts:** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of grassland, wooded grassland and woodland habitat • Flora and fauna stress and/or fatalities as a result of pollution of grassland, wooded grassland and woodland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Cumulative Impacts:** Negligible cumulative impacts if all mitigation measures are implemented effectively and important biota effectively rescued and removed.	**LOW**	possible. • The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved. • 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 constriction 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: o Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. o The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. o The outer edges of the entire construction corridor / right-of-way. • Refer to **section 7of Appendix E2** for **general mitigations** on o 7.1.1. Powerline Alignments and Pylon Siting o 7.1.2. Powerline Access and Service Roads o 7.2.1. Powerline Access and Haulage Roads o 7.2.2. Threatened and Protected Plant Search and Rescue o 7.2.3. Demarcation of 'No-Go' areas and construction corridors o 7.2.4. Method Statements for working in primary grasslands o 7.2.10. General rehabilitation guidelines o 7.2.11. Construction phase monitoring measures	

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
during planned direct impacts to primary and secondary grassland for • pylon establishment • Access road • Accidental direct impacts due heavy machinery during construction i.e. poorly planned access roads	**Direct Impacts:** *Impacts to local and regional landscape ecological processes* • Ecosystem fragmentation • Fauna displacement and/or fatalities **Indirect Impacts:** • Flora and fauna stress and/or fatalities as a result of erosion and/or sedimentation of grassland, wooded grassland and woodland habitat • Flora and fauna stress and/or fatalities as a result of pollution of grassland, wooded grassland and woodland habitat due to the mishandling of hazardous substances and/or improper maintenance of machinery during construction e.g. oil and diesel leaks and spills. **Cumulative Impacts:** none	**LOW**	• The distance between of the powerlines and pylon / tower sites and the mountain slopes with good condition wooded grassland must be maximised as far as practically possible. • The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved. • 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 identifty 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 constriction 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: o Outer edge of the dolerite outcrops within 50m of pylon sites and access / service roads and the 50m buffer zone to these outcrops. o The outer edges of the delineated watercourses within 30m of pylon sites and access / service roads and the 30m buffer zone to these watercourses. o The outer edges of the entire construction corridor / right-of-way. • Refer to **section 7of Appendix E2** for **general mitigations** on o 7.1.1. Powerline Alignments and Pylon Siting o 7.1.2. Powerline Access and Service Roads o 7.2.1. Powerline Access and Haulage Roads o 7.2.2. Threatened and Protected Plant Search and Rescue o 7.2.3. Demarcation of 'No-Go' areas and construction corridors o 7.2.4. Method Statements for working in primary grasslands	**LOW**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
			○ 7.2.10. General rehabilitation guidelines ○ 7.2.11. Construction phase monitoring measures	
OPERATIONAL PHASE IMPACTS				
Accidental direct impacts to primary and secondary grassland by heavy machinery during repair and maintenance i.e. poorly planned access roads.	**Direct Impacts:** *Impacts to terrestrial vegetation communities and habitat:* • Direct ecosystem destruction and modification impacts **Indirect Impacts:** • 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. **Cumulative Impacts:** Negligible degradation of primary grassland type if the recommended mitigation measures are effectively implemented.	**MODERATE-LOW**	• Refer to **section 7of Appendix E2** for **general mitigations** on ○ 7.1.3. Service Road Stormwater Management ○ •7.3.2. Monitoring	**LOW**
Accidental direct impacts to primary and secondary grassland by heavy machinery during repair and maintenance i.e. poorly planned access roads. soil and vegetation	**Direct Impacts:** ***focussing on avifauna, the destruction and modification impacts:*** • Bird injury and fatalities as a result of powerline bird collisions and electrocutions. • Fauna displacement and/or fatalities **Indirect Impacts:** • Flora and fauna stress and/or fatalities as a result of erosion	**MEDIUM**	• The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved. • Mitigation measures to reduce the occurrence of bird collisions with powerlines: ○ 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	**MODERATE-LOW**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
clearing and landcover disturbance during repair and maintenance. mishandling of hazardous substances and/or improper maintenance of machinery during repair and maintenance.	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 **Cumulative Impacts:** Small reductions in threatened bird populations due to increased local and regional powerline collisions.		line with the current best environmental options. • Mitigation measures to reduce the occurrence of bird electrocutions: o 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 7of Appendix E2** for **general mitigations** on o 7.1.1. Powerline Alignments and Pylon Siting o 7.1.2. Powerline Access and Service Roads o 7.1.4. Avifauna Impact Mitigation Design Measures o 7.3.1. Maintenance and management o 7.3.2. Monitoring	
Due to soil and vegetation clearing and landcover disturbance during repair and maintenance. Accidental direct impacts to primary and secondary grassland by heavy machinery during dismantling and rehabilitation i.e. poorly planned access roads.	**Direct Impacts:** *Impacts to local and regional landscape ecological processes* • Fauna displacement and/or fatalities **Indirect Impacts:** • 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 **Cumulative Impacts:** none	**LOW**	• 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. • Refer to **section 7of Appendix E2** for **general mitigations** on o 7.1.4. Avifauna Impact Mitigation Design Measures o 7.3.1. Maintenance and management o 7.3.2. Monitoring	**LOW**

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				
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	**Direct Impacts:** Loss or damage to sites, features or objects of cultural heritage significance **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.	**LOW**	• For the current study, as no sites, features or objects of cultural significance were identified, no mitigation measures are proposed. • 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**
OPERATIONAL PHASE IMPACTS				
		LOW	• Maintenance activities should not impact on features or objects of cultural heritage significance	**LOW**

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, 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 **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.	**LOW**	• 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**
OPERATIONAL PHASE IMPACTS				
	Destruction, Damage & Loss of fossil material	**LOW**	• Maintenance activities should not impact on fossiliferous outcrops • Maintenance vehicles must stay on dedicated roads/ servitudes	**LOW**

7.2.5 Visual Impacts Assessment

Table 7.5 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 7.5: Visual Impact Assessment

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
CONSTRUCTION PHASE IMPACTS				
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 underlaying 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.	**Direct Impacts:** Severity of impacts on observers (OB) and landscape character (LC) **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. **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.	**MEDIUM**	**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; **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. **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. **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.	**MEDIUM**
OPERATIONAL PHASE IMPACTS				

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
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.	**Direct impacts:** **Severity of impacts on observers (OB) due to:** • Visual change that will cause visual intrusion. • Alteration to the landscape character. Increased visual dominance of power infrastructure.	**HIGH**	Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature;	**VERY LOW**
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.	**Direct impacts:** **Severity of impacts on the landscape character (LC) due to:** • Visual change that will cause visual intrusion. • Alteration to the landscape character. Increased visual dominance of power infrastructure.	**MEDIUM**	Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature;	**VERY LOW**

7.2.6 Agriculture Potential Impact Assessment

Table 7.6 below lists 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 **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 lead to additional spatial or land use impacts.	**LOW**	• 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**
OPERATIONAL PHASE IMPACTS				
Operation of the power lines	Loss of agricultural production	**LOW**	• Pylon footprints and infrastructure are permanent and the pylons cannot be mitigated	**LOW**

7.2.7 Social Impacts Assessment

Table 7.7 below lists 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				
Construction and operation activities of the power line	**Direct Impacts:** Inflow of Workers **Indirect Impacts:** The influx of outsiders to an area is also almost always perceived to increase the crime levels in such an area. One could therefore assume that security concerns would be prevalent among the local residents. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	• Local labourers should be employed where possible. • Labourers should remain at their existing residences. No workers should thus be accommodated on site at night. The erection of a construction camp where workers would be housed would not be recommended. • Before construction commences, representatives from the municipality, other community leaders (e.g. councillors) and as well as management structures of the security villages and complexes, as well as residential areas should be informed of the details of the contractors, size of the workforce and construction schedules. • The contractor should make certain that the "outside" workforce carry identification tags or uniforms to be easily identifiable. It should furthermore be ensured that the inflow of workers and their presence in the local communities do not create conflict in the surrounding communities. • Local community organisations and policing forums / neighbourhood watches must be informed of the presence of an outside workforce (where relevant).	**LOW**
Construction and operation activities of the power line	**Direct Impacts:** Employment Opportunities (positive) **Indirect Impacts:** Construction workers remaining in the larger area once this development has been completed. **Cumulative Impacts:** Construction workers remaining in the larger area once this development has been completed.	**LOW**	Enhancements: • The use of local labour should be maximised where possible. • Local people could be employed during the construction phase as Community Liaison officers. • Eskom and the appointed contractors should promote capacity building through skills development. • Eskom and the appointed contractors should create conditions that are conducive for the involvement of entrepreneurs, small businesses and SMME's during the construction and operational process. • Tender documentation should contain guidelines for the involvement of labour, entrepreneurs, businesses and SMME's from the local sector.	**MEDIUM**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
Construction machinery that is usually used for projects of this nature includes excavators, TLB's, tipper trucks and compactors	**Direct Impacts:** Disturbance of daily Living and Movement Patterns **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. **Cumulative Impacts:** Possible impact on daily living and movement patterns due to various power lines within the study area	**LOW**	• 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.	**LOW**
Construction and operation activities of the power line	**Direct Impacts:** Impact on Sense of Place **Indirect Impacts:** Possible negative visual change in the landscape character **Cumulative Impacts:** Possible impact on overall visual environment due to various power lines and infrastructure within the study area	**LOW**	• Construction sites should be screened from the property owners and mtorists where possible. • Stockpiling of soil should be as short as possible and construction debris should be removed as soon as construction activities allow. • Construction sites should be rehabilitated as soon as planning allows • Tower placements should preferably be as far from dwellings as possible	**LOW**
Construction and operation activities of the power line	**Direct Impacts:** Impact on Tourist Related Establishments **Indirect Impacts:** Possible visual impact of pylons on properties used for tourism activities and accommodation	**MEDIUM**	• Working hours should be kept to normal working hours (e.g. 7 am until 5 pm) during the construction phase • Construction sites should be fenced off to limit unauthorised entry and to limit negative visual impacts. • Construction sites should be screened from the property owners and guests where possible. • Stockpiling of soil should be as short as possible and construction debris should be	**LOW**

ACTIVITY	NATURE OF POTENTIAL IMPACT/RISK	SIGNIFICANCE (WITHOUT MITIGATION)	PROPOSED MITIGATION	SIGNIFICANCE (WITH MITIGATION)
	Cumulative Impacts: None anticipated		removed as soon as construction activities allow. • Construction sites should be rehabilitated as soon as planning allows • Avoid placing the proposed distribution line in close view of the main activities at the tourism establishments. • Construction sites should be rehabilitated as soon as planning allows • Clearing of vegetation should be avoided around the site	
Construction and operation activities of the power line	**Direct Impacts:** Safety and Security Related Impacts **Indirect Impacts:** Increased risks of fires due to presence of the power line **Cumulative Impacts:** None anticipated	**LOW**	• 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 should thus remain within the construction site boundaries. • 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	**LOW**

8 CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes the Basic Assessment Report for the proposed **Vryheid 2x 88 kV Turn-In Power Lines** 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:

Although there are nine (9) watercourse crossings proposed, if proper environmental planning is implemented and pylons are placed to avoid all watercourses and areas sensitive to erosion, the impacts in terms of degradation in the provision of regulating ecosystem services that support freshwater water resources management, disaster management and climate adaptation should be low and the project should be acceptable. *It is also important to note that for the NEMA EA application, a section of the powerline has already received Environmental Authorisation and only the assessment of VRY R01, R03, R04, W01, W02, W03 and W08 applies*

Terrestrial Biodiversity (vegetation and Fauna)

The proposed powerline will likely result in small but measurable impacts to primary grassland, wooded grassland, possibly some rare plant species and threatened avifauna. The most significant impact of the proposed project activities is the Operational Impact to terrestrial biota because of powerline collisions and pylon / tower electrocutions, in particular the impacts to threatened bird species categorised as critically endangered, endangered and vulnerable. Operational Impact on biota (avifauna) was assessed as being of moderate significance under a poor mitigation scenario and potentially unacceptable. With the effective implementation of the mitigation measures recommended in Section 7.1 (Appendix E2), under a good mitigation scenario, the risks to be threatened birds can be reduce and the significance of operational Impact can be reduced to moderately-low significance. Although the implementation of flight diverters and bird-friendly pylon / tower designs will reduce the potential impacts to threatened bird species, impacts to such species is inevitable in the long-term.

In conclusion, provided that the mitigation measures recommended in this report are adhered to, 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 these sites for species of conservation concern; and the small anticipated on-the-ground footprint of the project activities.

Heritage Assessment:

As no sites, features or objects of cultural historic significance have been identified in the project area, there would be no impact as a result of the proposed development. 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 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 and tourists 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 on the agricultural holdings and farms 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 only tourist attraction within this zone is the Mpofini Game Lodge, but visual exposure is limited due to topography and tall vegetation partially screening views towards the proposed powerlines. Their sensitivity rating is lowered.

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, but also has areas that are more industrial in character. This places it in a peri-urban classification, but with a tendency of being more rural than urban. The additional powerlines will contribute to a more peri-urban 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:

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. With regards to the fauna in the area, diminished species diversity and persistence in the area can take place if impacts are not properly mitigated. 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.

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 Vryheid 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	Medium	Low
Impacts to Freshwater Ecosystem Conservation	Medium	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	Moderately-Low	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	Medium	Low
Impacts to Freshwater Ecosystem Conservation	Medium	Low
Impacts to Freshwater Species Conservation;	Low	Low
Terrestrial Biodiversity Impact		
Impacts to terrestrial vegetation communities and habitat: Direct ecosystem destruction and modification impacts	Moderately-Low	Low
Impacts to Avifauna: • 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: • Visual change that will cause visual intrusion. • Alteration to the landscape character. • Increased visual dominance of power infrastructure	High	Very Low
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 Sensitivity 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**: The proposed powerline alignment crosses and is near several wetland and river units. Each of these watercourses could potentially be impacted by the project, depending on the location of

powerline pylons. Although there are nine (9) watercourse crossings within the project area, only five (5) of these will be directly affected by the project.

- **Vegetation**
  - A small section of the Degraded primary grasslands of high-moderately Ecological Importance and Sensitivity is affected by the project, the majority of this grassland is within the approved/authorised corridor
  - One threatened plant was in the vicinity of the project areas, this will not be directly affected by the proposed powerline alignments.

- **Visual Impacts**
  - Tourists: Tourists are generally classified as observers with a high sensitivity when their reason for visiting the area is focussed on enjoying the visual quality and engaging in outdoor activities that are offered by the study area's natural landscape. A number of tourist attractions and outdoor activities are hosted in the area, in particularly fishing and birdwatching at the Klipfontein Dam and Ekuthuleni Wedding and Conference Venue. Game viewing and hunting are hosted at the Mpofini Game Lodge which is the nearest to the proposed projects;
  - Residents in the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. Residents in the ZMVE are limited to the rural communities living on the few agricultural holdings and small farms within 1km from the proposed power lines. These will have a high sensitivity. Residents from Lakeside and Bhekuzulu, as well as from Inkamana Abbey, are outside the ZMVE and will have a reduced visual exposure;
  - Motorists are considered the least sensitive group of observers due to the speed at which they travel and their brief exposure to impacts. This group is limited to road users of the R34 and R69. Intermitted views and a brief exposure to the proposed powerlines are expected as motorists travel through the study area. Viewer incidence is expected to be medium

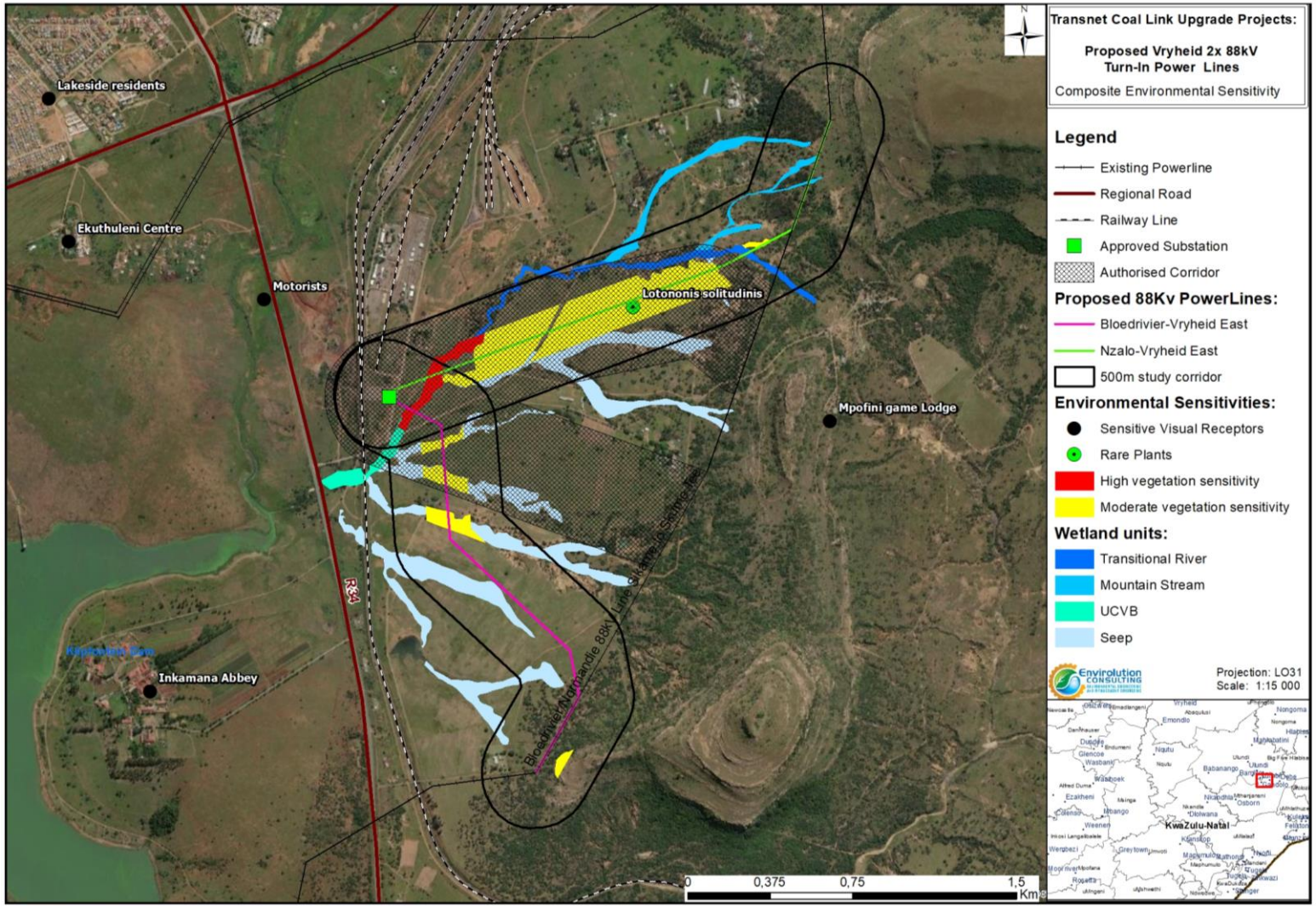


Figure 8.1: Composite Environmental Sensitivity Map for the proposed Vryheid 88kV Powerlines showing areas of high sensitivity (A3 map included in **Appendix A**).

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 **Vryheid 2x 88 kV Turn-In Power Lines** 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*.

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 he 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 Vryheid 2x 88 kV Turn-In 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 30m 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 distance between of the powerlines and pylon / tower sites and the mountain slopes with good condition wooded grassland must be maximised as far as practically possible.
  - The number of pylons or towers within the vegetation communities of moderate importance (i.e. primary grasslands, wooded grasslands and woodland) must be minimised to the minimum number necessary and maximum span lengths across these areas must be achieved.
  - 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 constriction 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.

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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