iWink Consulting
Traffic & Transport Engineering
Road Safety

PROPOSED CONSTRUCTION OF A MAIN TRANSMISSION SUBSTATION AND LOOP-IN-LOOP-OUT GRID CONNECTION FOR UJEKAMANZI WIND ENERGY FACILITY 1

Transport Impact Assessment

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EXECUTIVE SUMMARY

This report serves as the Traffic Impact Assessment (TIA) aimed at determining the traffic impact for the construction of a Main Transmission Substation (MTS) and a Loop-In-Loop-Out (LILO 1) grid connection to connect the Ujekamanzi Wind Energy Facility (WEF) 1 to the national electricity grid.

The Ujekamanzi WEF 1 is proposed to be located approximately 32 km south of Ermelo in the Mpumalanga Province of South Africa. The site will accommodate up to 65 wind turbines including associated support structures and facilities to allow for the generation and evacuation of electricity. To facilitate the connection of the Ujekamanzi WEF 1 project to the national grid, it is proposed that the electrical grid connection will likely comprise of a new 400 kV Loop-In-Loop-Out (LILO) from the existing 400 kV Overhead Power Line to the proposed MTS. The proposed LILO will be located at a point where the existing powerline crosses the project site.

Several potential access points were investigated considering suitability concerning sight lines, access spacing requirements and landownership. Where sight line issues have been noted, it is recommended that the sight lines be improved to improve road safety (i.e., allowing for a setback distance that will remain clear of vegetation and obstructions, or accommodating a convex roadside mirror where necessary).

It is expected that non-motorised transportation (NMT) is a dominant mode of transportation in the in the environment of the site, with private cars and minibus/taxis being the second-most used mode of transport, followed by buses. Currently, there are no known future planned public transport facilities in the vicinity of the site. However, generally the developer of a renewable energy project will provide shuttle buses for workers during the construction phase.

The highest trip generator for the site is expected during the construction phase. The actual construction stage peak hour trips are dependent on the construction period, construction programming, material availability, component delivery, abnormal load permitting etc. The decommissioning phase is expected to generate similar trips as the construction phase. The traffic impact during the operational phase is considered low.

For the construction, operational and decommissioning phases, the impact expected to be generated by the vehicle trips is an increase in traffic and the associated noise, dust, and exhaust pollution, which is addressed in Section 7 of this report. Based on the high-level screening of impacts and post mitigation, the proposed project is expected to have a low significance rating during the construction and decommissioning stage, as well as during the operational stage.

It is recommended to read this report in conjunction with the TIA report conducted for the proposed Ujekamanzi WEF 1 project.

UJEKAMANZI MTS & LILO 1 (FOR WEF 1)

1 INTRODUCTION

1.1 Project Description

ABO Wind Renewable Energies (Pty) Ltd. is proposing the construction of a Main Transmission Substation (MTS) and Loop-In-Loop-Out (LILO 1) grid connection for the proposed Ujekamanzi WEF 1 project is one of two proposed Wind Energy Facilities, which will be located approximately 32 km south of Ermelo in the Mpumalanga Province (see **Figure 1-1**).

The proposed development of a 400 kV/132 kV MTS will include associated infrastructure, such as a 132 kV busbar and feeder bay(s) and a 500 MVA 400 kV/132 kV transformer (with transformer bay). A single Substation hub could be combined with the MTS. Alternatively, a 132kV line will connect the Substation hub with the MTS. These support structures for the Ujekamanzi WEF 1 project will not fall within a Renewable Energy Development Zone or strategic power corridor.

It is proposed that the Ujekamanzi WEF 1 will comprise of up to 65 turbines with a contracted capacity of up to 650 MW, which will need to be evacuated into the national grid. To facilitate the connection of the Ujekamanzi WEF 1 project and the grid, it is proposed that a new 400kV LILO will be constructed from the existing 400 kV Overhead Power Line (OHL) to the proposed MTS.

Figure 1-2 shows both wind energy facilities – Ujekamanzi WEF 1 on the southern side and Ujekamanzi WEF 2 on the northern side. Four location alternatives are currently proposed for a MTS for Ujekamanzi WEF 1 (red circle) with the LILO (“LILO 1”) shown in yellow, connecting to the existing Eskom grid infrastructure (shown in green).

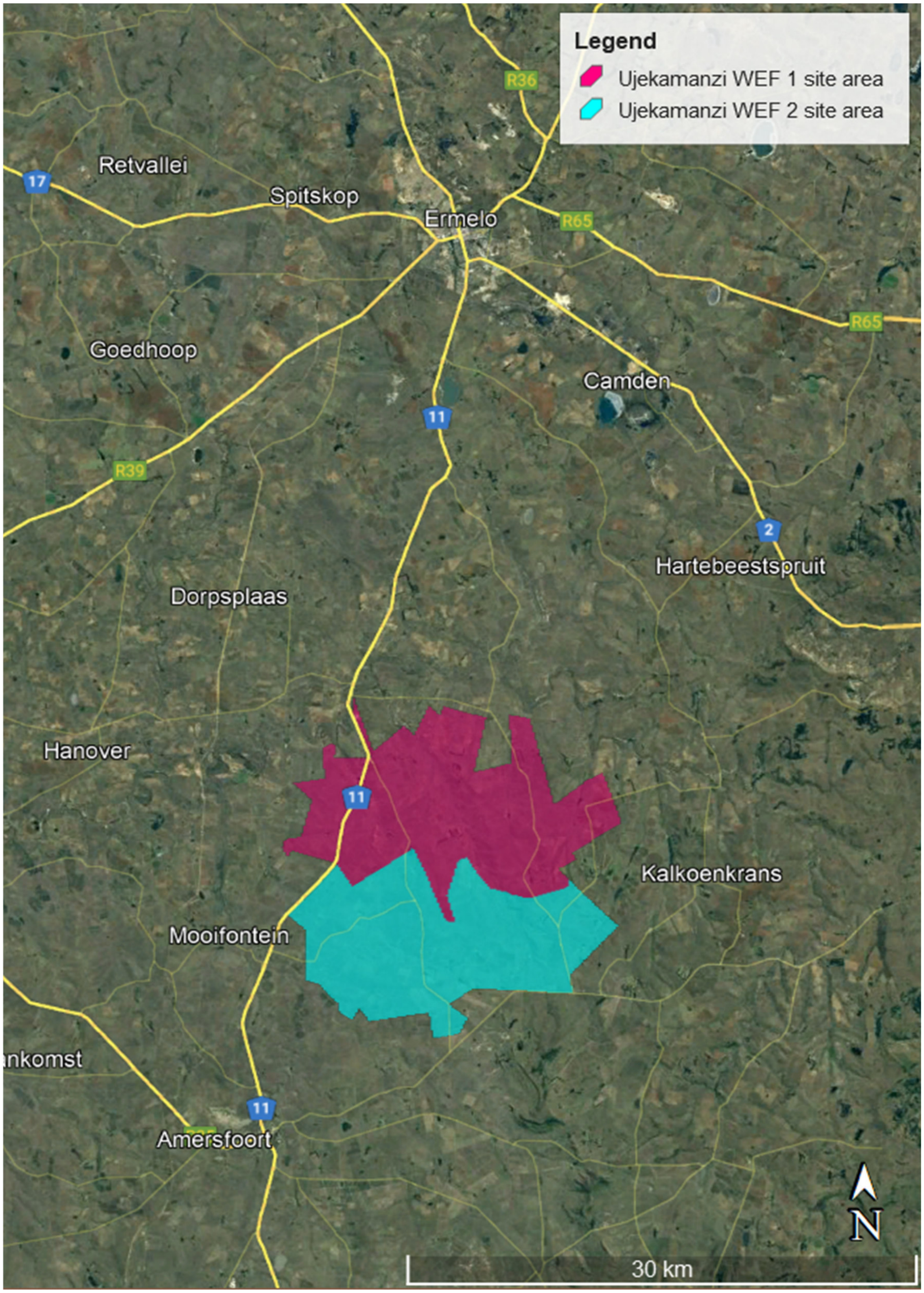

Figure 1-1: Aerial View of Ujekamanzi WEF 1 and 2 project site areas

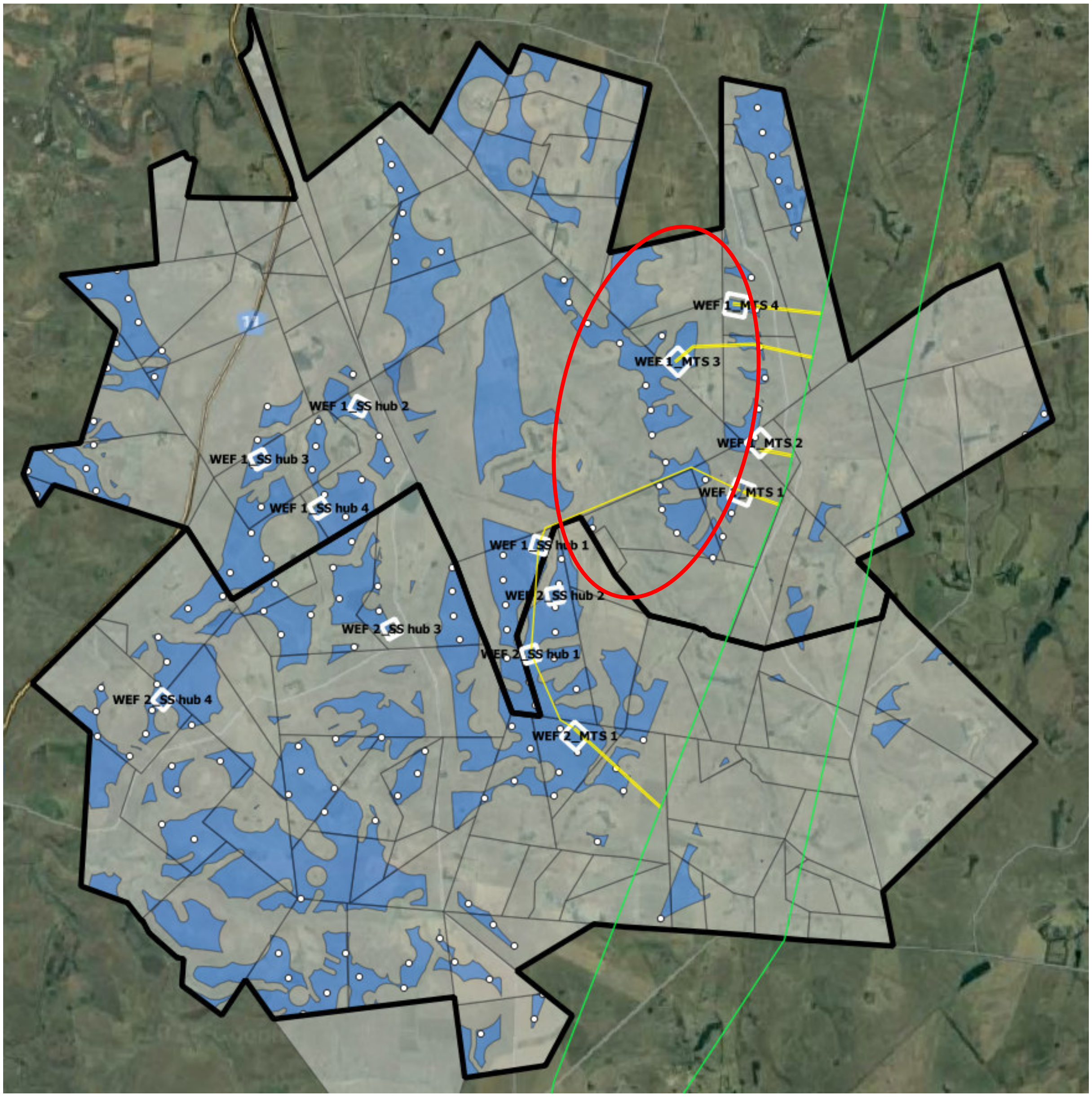

Figure 1-2: Aerial View of electrical Infrastructure for the Ujekamanzi WEF projects

1.2 Main Transmission Substation (MTS)

The construction of one Main Transmission Substation is proposed for Ujekamanzi WEF 1 project, which will be a 400 kV/132kV MTS. The following activities will form part of the development of the MTS:

- Surveys will need to be conducted by the developer at the respective location(s);
- Site clearing and levelling;
- Construction of an access road (if required) to the proposed substation;
- Construction of substation terraces and foundations;
- Assembly and installation of equipment (including transformers);
- Testing of equipment; and

- Rehabilitation of any disturbed and protection of erosion sensitive areas.

At the time of preparing this report, four possible location alternatives were proposed for the MTS. However, the exact location will be determined during the detailed design phase.

1.3 Loop-In-Loop-Out (“LILO 1”)

To enable the connection of the Ujekamanzi WEF 1 to the national grid, the preferred electrical grid connection, at the time of preparing this report, was a new 400 kV Loop-In-Loop-Out (“LILO 1”) grid connection from the existing 400 kV Overhead Power Line (OHL) to the proposed MTS. The LILO is planned to be located at a point where the existing powerline crosses the project site.

The following activities will form part of the development of the LILO:

- Surveys will need to be conducted at the location where the OHL will be constructed;
- Site clearing and levelling (if required);
- Construction of an access road (if required) to the proposed pylon positions;
- Construction foundations;
- Assembly and installation of equipment;
- Testing of equipment; and
- Rehabilitation of any disturbed and protection of erosion sensitive areas.

Exact locations for any cabling having to be installed will be determined at the detailed design phase.

1.4 Scope, Purpose, and Objectives of Specialist Report

The Transport Impact Assessment is aimed at determining the traffic impact of the construction of the MTS and LILO 1, and whether the additional traffic can be accommodated by the external transportation system.

The following two main transportation activities will be investigated:

- Abnormal load vehicles transporting components to the site.
- The transportation of construction materials, equipment and people to and from the site/facility.

The transport impact assessment will aim to provide the following objectives:

- Assess activities related to traffic movement for the construction and operation (maintenance) phases of the facility.
- Recommend a preliminary route for the transportation of the components to the proposed site;
- Recommend a preliminary transportation route for the transportation of materials, equipment and people to site; and
- Recommend alternative or secondary routes where possible.

1.5 Details of Specialist

Iris Sigrid Wink of iWink Consulting (Pty) Ltd. is the Traffic & Transportation Engineering specialist appointed to provide a Transport Impact Assessments for the Ujekamanzi Wind Energy Facilities and MTS & LILO constructions. Iris Wink is registered with the Engineering Council of South Africa (ECSA), with Registration Number 20110156. A curriculum vitae is included in **Appendix A** of this specialist assessment.

In addition, a signed specialist statement of independence is included **in Appendix B** of this specialist assessment.

1.6 Terms of Reference

A specialist report prepared in terms of the Regulations (*published In Government Notice No. 320 Government Gazette 43110 20 March 2020, gazetted for implementation Site Sensitivity Verification requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed*) must contain the following:

(a) details of-
(i) the specialist who prepared the report; and
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;
(c) an indication of the scope of, and the purpose for which, the report was prepared;
(cA) an indication of the quality and age of base data used for the specialist report
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;
(d) the duration date and season of the site investigation and the relevance of the season to the outcome of the assessment;
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;
(g) an identification of any areas to be avoided, including buffers;
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;
(k) any mitigation measures for inclusion in the EMPr;
(l) any conditions for inclusion in the environmental authorisation;
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;
(n) a reasoned opinion-

(i) whether the proposed activity, activities or portions thereof should be authorised; and (considering impacts and expected cumulative impacts).

(iA) regarding the acceptability of the proposed activity or activities, and

(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;

(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;

(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and

(q) any other information requested by the competent authority.

Specific:

- Extent of the transport study and study area;
- The proposed construction;
- Traffic impact on external road network;
- Accessibility and turning requirements;
- National and local haulage routes;
- Assessment of internal roads and site access;
- Assessment of freight requirements and permitting needed for abnormal loads; and
- Traffic accommodation during construction.

2 APPROACH AND METHODOLOGY

The report deals with the traffic impact on the surrounding road network in the vicinity of the project site during the:

- Construction phase;
- Operational phase; and
- Decommissioning phase.

This transport study includes the following tasks:

Project Assessment

- Communication with the project team to gain sound understanding of the project.
- Overview of available project background information including, but not limited to, location maps, site development plans, anticipated vehicles to the site (vehicle type and volume), components to be transported and any resulting abnormal loads.
- Research of all available documentation and information relevant to the proposed facility.

Haulage Route Assessment

- Determination of possible haulage routes to site regarding:
  - National routes
  - Local routes
  - Site access points
  - Road limitations due to abnormal loads

Traffic Estimation and Impact

- Construction, operational, and decommissioning phase vehicle trips
  - Generated vehicles trips
  - Abnormal load trips
  - Access requirements
- Investigation of the impact of the development traffic generated during construction, operation, and decommissioning.

Report (Documentation)

- Reporting on all findings and preparation of the report.

2.1 Information Sources

The following guidelines have been used to determine the extent of the traffic study:

- Manual for Traffic Impact Studies, Department of Transport, 1995;
- TRH26 South African Road Classification and Access Management Manual, COTO;
- TMH 16 South African Traffic Impact and Site Traffic Assessment Manual (Vol 1), COTO, August 2012;
- TMH 16 South African Traffic Impact and Site Traffic Assessment Manual (Vol 2), COTO, February 2014;
- Google Earth Pro;
- Transnet Port terminals website; and
- Eastern Cape Roads Asset Management System.

2.2 Assumptions, Knowledge Gaps and Limitations

The following assumptions and limitations apply:

- This study is based on the project information provided by the client as available at commencement of the Scoping Phase.
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000 mm, total maximum width 4 300 mm and total maximum length 10 500 mm.

  It is envisaged that for this project, the inverter, transformer, and switchgear will be transported to site in containers on a low bed truck and trailer. A mobile crane and the transformer transport are the only abnormal load envisaged for the site. The crane will be utilised for offloading equipment, such as the transformers.
- Maximum vertical height clearances along the haulage route are 5.2 m for abnormal loads.
- If any elements are manufactured within South Africa but not on-site, these will be transported from their respective manufacturing centres, which would be either in the greater Cape Town area, Johannesburg, or possibly Pinetown/Durban.
- All haulage trips will occur on either surfaced national and provincial roads or existing gravel roads.
- Material for the construction of internal access roads will be sourced locally as far as possible.
- The final access points are to be determined during the detailed design stage. Only recommended access points at conceptual level can be given at this stage.
- Projects in the vicinity of the site to be considered as part of the EIA cumulative impacts are listed in Table 6-1.
- A 12-month construction period is assumed.

2.3 Consultation Processes Undertaken

The Transport Impact Assessment is based on available project information and consultation with the developer.

3 LEGISLATIVE AND PERMIT REQUIREMENTS

Key legal requirements pertaining to the transport requirements for the proposed development are:

- Abnormal load permits, (Section 81 of the National Road Traffic Act 93 of 1996 and National Road Traffic Regulations, 2000),
- Port permit (Guidelines for Agreements, Licenses and Permits in terms of the National Ports Act No. 12 of 2005), and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

4 DESCRIPTION OF PROJECT ASPECTS RELEVANT TO THE TIA

4.1 Port of Entry

It is envisaged that any components to be imported to South Africa, will arrive either via the Port of Richards Bay or the Port of Durban, as these two ports are the closest to the site.

It is, however, assumed that many components for the construction of LILO 1 can be sourced locally and would thus not require importing.

4.1.1 Port of Richards Bay

The Port of Richards Bay is situated on the coast of KwaZulu-Natal and is a deep-sea water port boasting 13 berths. The terminal handles dry bulk ores, minerals and break-bulk consignments with a draft that easily accommodates Cape size and Panamax vessels. The Port is operated by Transnet National Ports Authority. The Port of Richards Bay is located approximately 450 km from the proposed Ujekamanzi WEF sites traveling via the N2 (see **Figure 4-1**).

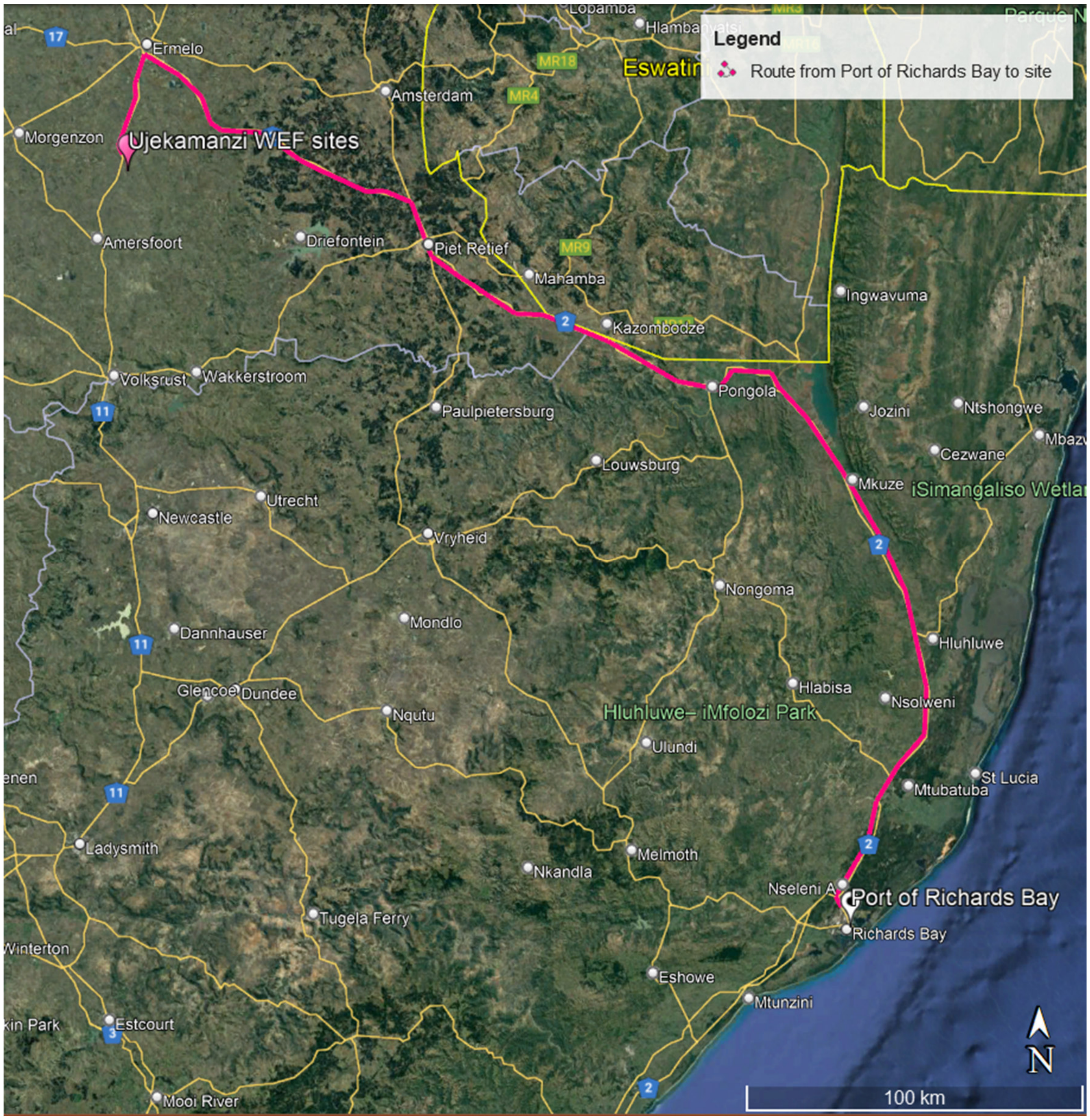

Figure 4-1: Route from the Port of Richards Bay to Ujekamanzi WEF project sites

4.1.2 The Port of Durban

The Durban container terminal is one of the largest container terminals in the African continent and operates as two terminals Pier 1 and Pier 2. It is ideally located to serve as a hub for containerized cargo from the Indian Ocean Islands, Middle East, Far East and Australia. Various capacity creation projects are currently underway, including deepening of berths and operational optimization. The terminal currently handles 65% of South Africa's container volumes. (Transnet Port Terminals, n.d).

The Port of Durban is located approximately 460 km distance traveling via the N3 and N11 to the proposed project site (see **Figure 4-2**).

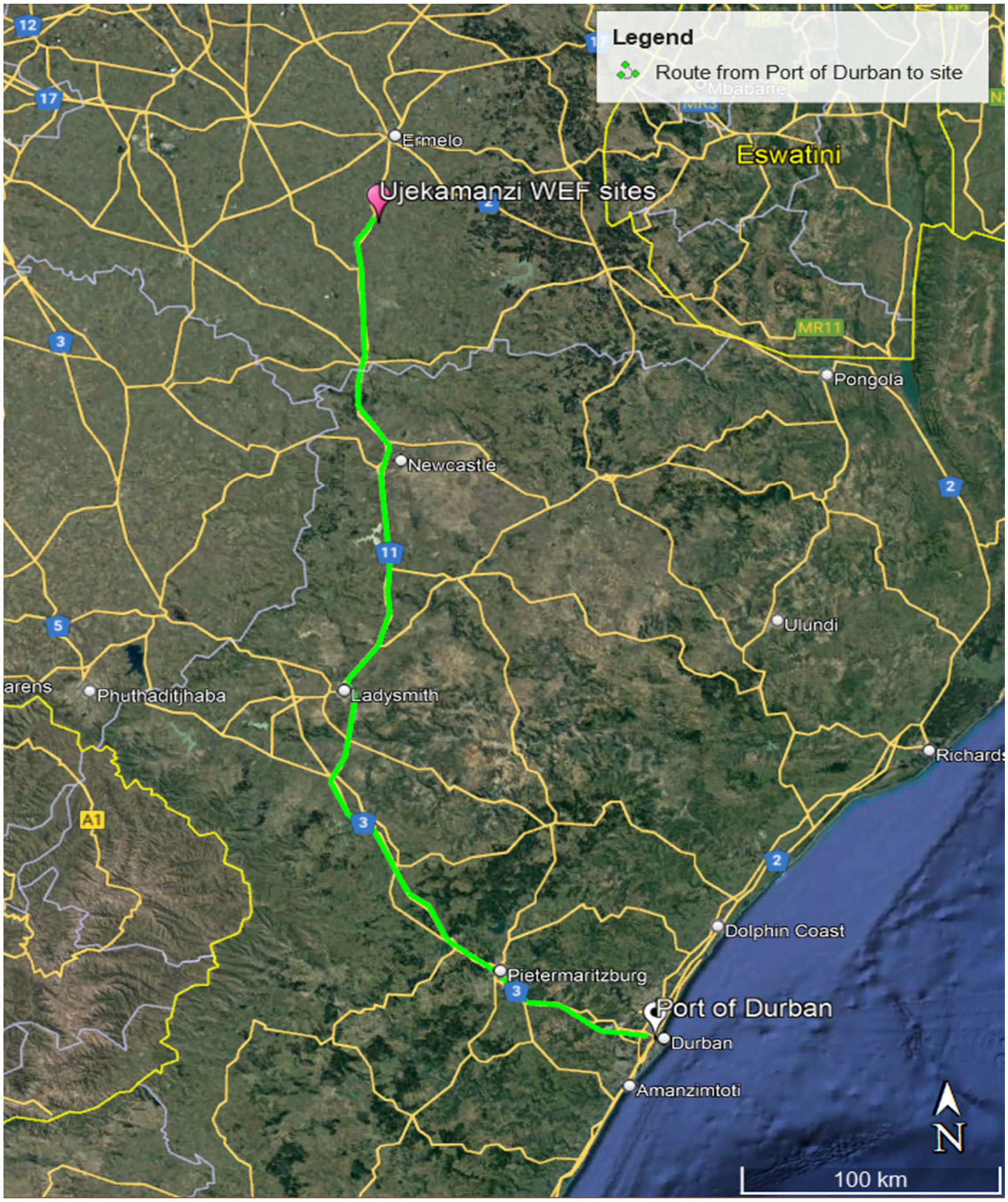

Figure 4-2: Route from Port of Durban to proposed site

4.2 Transportation requirements

It is anticipated that the following vehicles will access the site during construction:

- Conventional trucks within the freight limitations to transport building material to the site;
- 40ft container trucks transporting steel sections, conductors and insulators, which are within freight limitations;
- Flatbed trucks transporting the steel sections, cables, etc., which are within the freight limitations;
- Light Differential Vehicle (LDV) type vehicles transporting workers from surrounding areas to site;
- Drilling and piling machines and other required construction machinery being transported by conventional trucks or via self-drive to site.

4.3 Abnormal Load Considerations

It is expected that the transformers for Collector Substation A and Collector Substation B (as assessed in separate studies) will be transported with an abnormal load vehicle. Other expected abnormal vehicles will comprise of lifting equipment required to off-load and assemble the components. Mobile cranes are considered for the purposes of this report and are classified as non-load carrying vehicles. Mobile cranes usually exceed mass and legal dimension limits and must therefore be operated under permit. Abnormal permits are required for vehicles exceeding the following permissible maximum dimensions on road freight transport in terms of the Road Traffic Act (Act No. 93 of 1996) and the National Road Traffic Regulations, 2000:

- Length: 22m for an interlink, 18.5m for truck and trailer and 13.5m for a single unit truck
- Width: 2.6m
- Height: 4.3m measured from the ground. Possible height of load – 2.7m.
- Weight: Gross vehicle mass of 56t resulting in a payload of approximately 30t
- Axle unit limitations: 18t for dual and 24t for triple-axle units
- Axle load limitation: 7.7t on the front axle and 9t on the single or rear axles

Any dimension / mass outside the above will be classified as an Abnormal Load and will necessitate an application to the Department of Transport and Public Works for a permit that will give authorisation for the conveyance of said load. A permit is required for each Province that the haulage route traverses. It is estimated that no abnormal loads vehicles will be required other than the few trips needed to move mobile cranes to site. However, reference is made to other abnormal load vehicles and mitigation measures should it be necessitated by unforeseen circumstances/events.

4.4 Further Guideline Documentation

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” outlines the rules and conditions that 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 Road Traffic Act and the relevant regulations.

4.5 Permitting – General Rules

In general, the limits recommended in TRH 11 are intended to serve as a guide to the Permit Issuing Authorities. It must be noted that each Administration has the right to refuse a permit application or to modify the conditions under which a permit is granted. It is understood that:

a) A permit is issued at the sole discretion of the Issuing Authority. The permit may be refused because of the condition of the road, the culverts and bridges, the nature of other traffic on the road, abnormally heavy traffic during certain periods or for any other reason.
b) A permit can be withdrawn if the vehicle upon inspection is found in any way not fit to be operated.
c) During certain periods, such as school holidays or long weekends an embargo may be placed on the issuing of permits. Embargo lists are compiled annually and are obtainable from the Issuing Authorities.

4.6 Load Limitations

The maximum load that a road vehicle or combination of vehicles will be allowed to carry legally under permit on a public road is limited by:

- the capacity of the vehicles as rated by the manufacturer,
- the load which may be carried by the tyres,
- the damaging effect on pavements,
- the structural capacity on bridges and culverts,
- the power of the prime mover(s),
- the load imposed by the driving axles, and
- the load imposed by the steering axles.

4.7 Dimensional Limitations

A load of abnormal dimensions may cause an obstruction and danger to other traffic. For this reason, all loads must, as far as possible, conform to the legal dimensions. Permits will only be considered for indivisible loads, i.e., loads that cannot, without disproportionate effort, expense, or risk of damage, be divided into two or more loads for the purpose of transport on public roads. For each of the characteristics below there is a legally permissible limit and what is allowed under permit:

- Width, Height and Length,
- Front Overhang,
- Rear Overhang,
- Front Load Projection,
- Rear Load Projection,
- Wheelbase,
- Turning Radius, and
- Stability of Loaded Vehicles.

4.8 Transporting Other Plant, Material and Equipment

In addition to transporting the specialised equipment, the normal Civil Engineering construction materials, plant and equipment will need to be transported to the site (e.g., sand, stone, cement, gravel, water, compaction equipment, concrete mixers, etc.). Other materials/components required for the construction of the overhead lines can include electrical cables, ground wires, insulators, dampers, wire conductors, pylons/towers as support structures for electrical cables and associated pylon/tower foundations. These will also be transported to site during construction and will generally be conducted with normal heavy loads vehicles.

5 BASELINE ENVIRONMENTAL DESCRIPTION

5.1 General Description

The project site is located approximately 32 km south of Ermelo within the Dr. Pixley Ka Isaka Seme Local Municipality in the Mpumalanga Province (see **Figure 5-1**).

The proposed development of a 400 kV/132 kV Main Transmission Substation (MTS) will include associated infrastructure at the MTS, such as a 132 kV busbar and feeder bay(s) and a 500 MVA 400 kV/132 kV transformer (with transformer bay). A single Substation hub could be combined with the MTS. Alternatively, a 132kV line will connect the Substation hub with the MTS. These support structures for the Ujekamanzi WEF 1 project will not fall within a Renewable Energy Development Zone or strategic power corridor. To facilitate the connection of the WEF 1 project with the national grid, it is proposed that a new 400kV Loop-In-Loop-Out ("LILO 1") will be constructed from the existing 400 kV Overhead Power Line (OHL) to the proposed MTS. At present, four location alternatives are considered for the MTS catering for the Ujekamanzi WEF 1 project (see **Figure 5-1**).

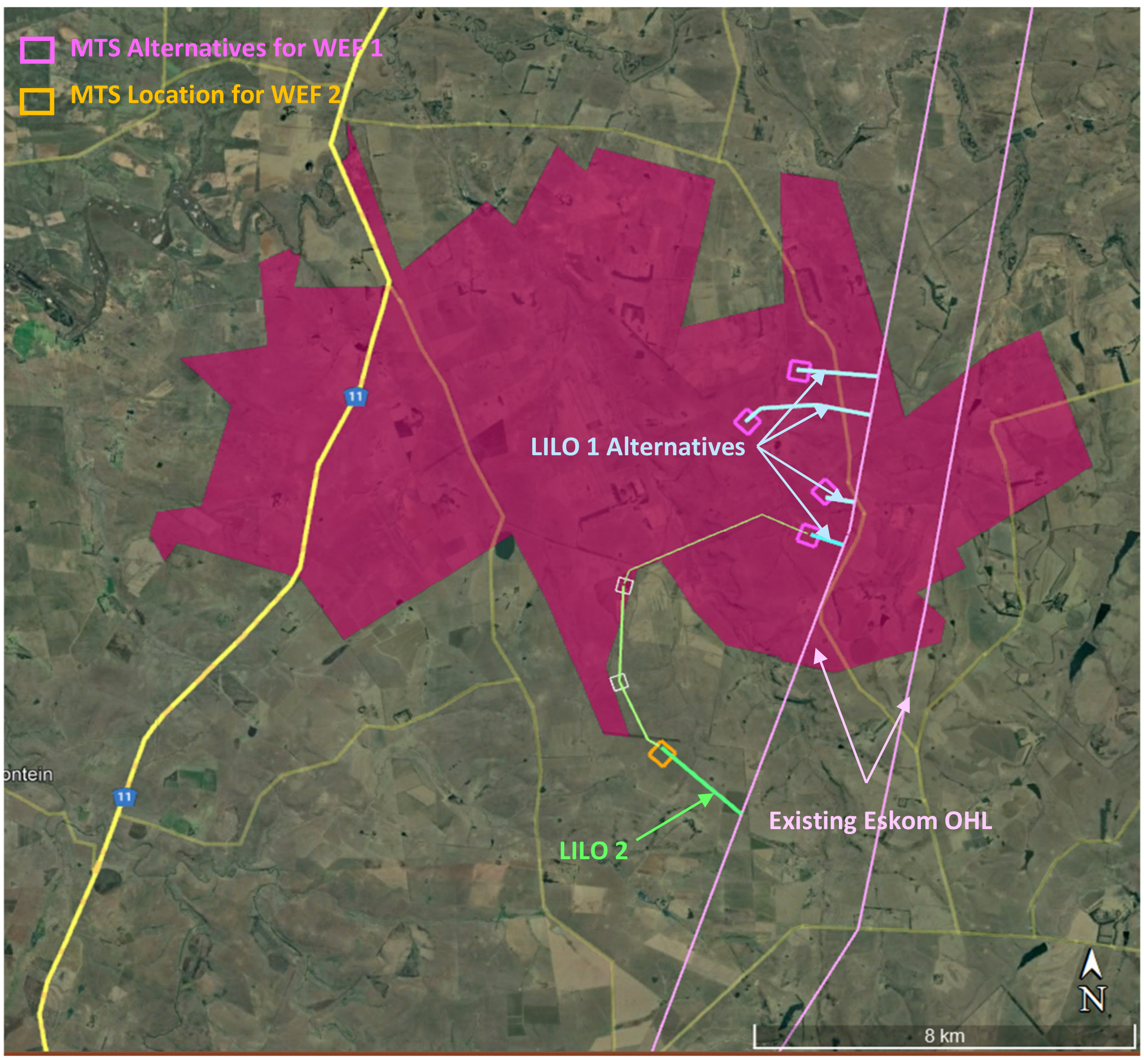

Figure 5-1: Aerial View of proposed Electrical Infrastructure for the Ujekamanzi WEF 1 project

5.1.1 Route for Components manufactured within South Africa

In South Africa, more than half (52%) of the manufacturing industry's national workforce resides in three metros - Johannesburg, Cape Town, and eThekwini. It is therefore anticipated that elements that can be manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg, or Pinetown/Durban areas. Components will be transported to site using appropriate National and Provincial routes. It is expected that the components will generally be transported to site with normal heavy load vehicles.

5.1.1.1 Route from Cape Town Area to Site – Locally sourced materials and equipment

Cape Town has a large manufacturing sector with twenty-six (26) industrial areas located throughout the metro.

The proposed industrial hubs being considered to source the required materials and components is currently unknown. With quite an extensive and widespread industrial market, a specific route to the site cannot be considered at this point in time, but it is expected that a majority of the route length will be similar to the routes considered for the haulage of imported materials and equipment (approximately 1 520 km via the N1). No road limitations envisaged along the route for normal load freight (see **Figure 5-2)**.

Figure 5-2: Route from Cape Town area to Ujekamanzi WEF project sites

5.1.1.2 Route from Johannesburg Area to Site – Locally sourced materials and equipment

If components from Johannesburg are considered, normal loads from Johannesburg to the site can be transported via the route as shown in **Figure 5-3** below. No road limitations are envisaged along the route for normal load freight. The travel distance from the Johannesburg area to the site is approximately 250 km via the N17.

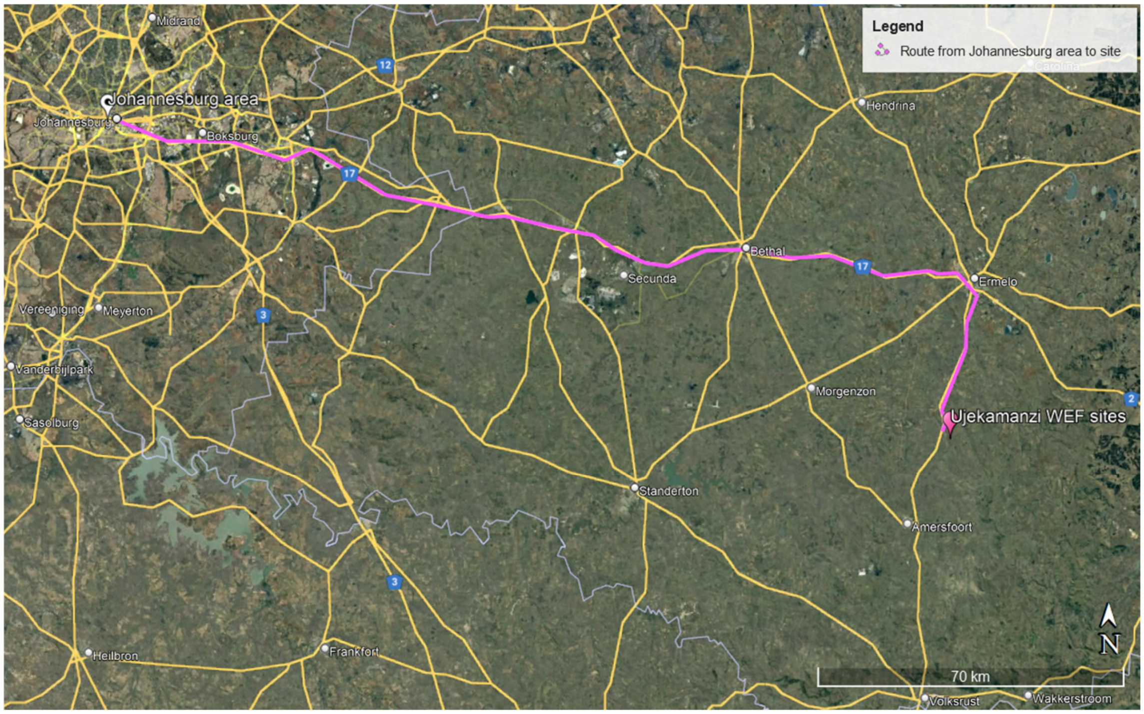

Figure 5-3: Route from Johannesburg area to Ujekamanzi WEF project sites

5.1.1.3 Route from Pinetown / Durban to Site - Locally sourced materials and equipment

Normal loads can transport elements via two potential routes from Durban and Pinetown to the site. No road limitations are envisaged along the route for normal load freight. The shortest travel distance from Pinetown area to the site is approximately 440 km via the N3 and N11 as shown in **Figure 5-4** below.

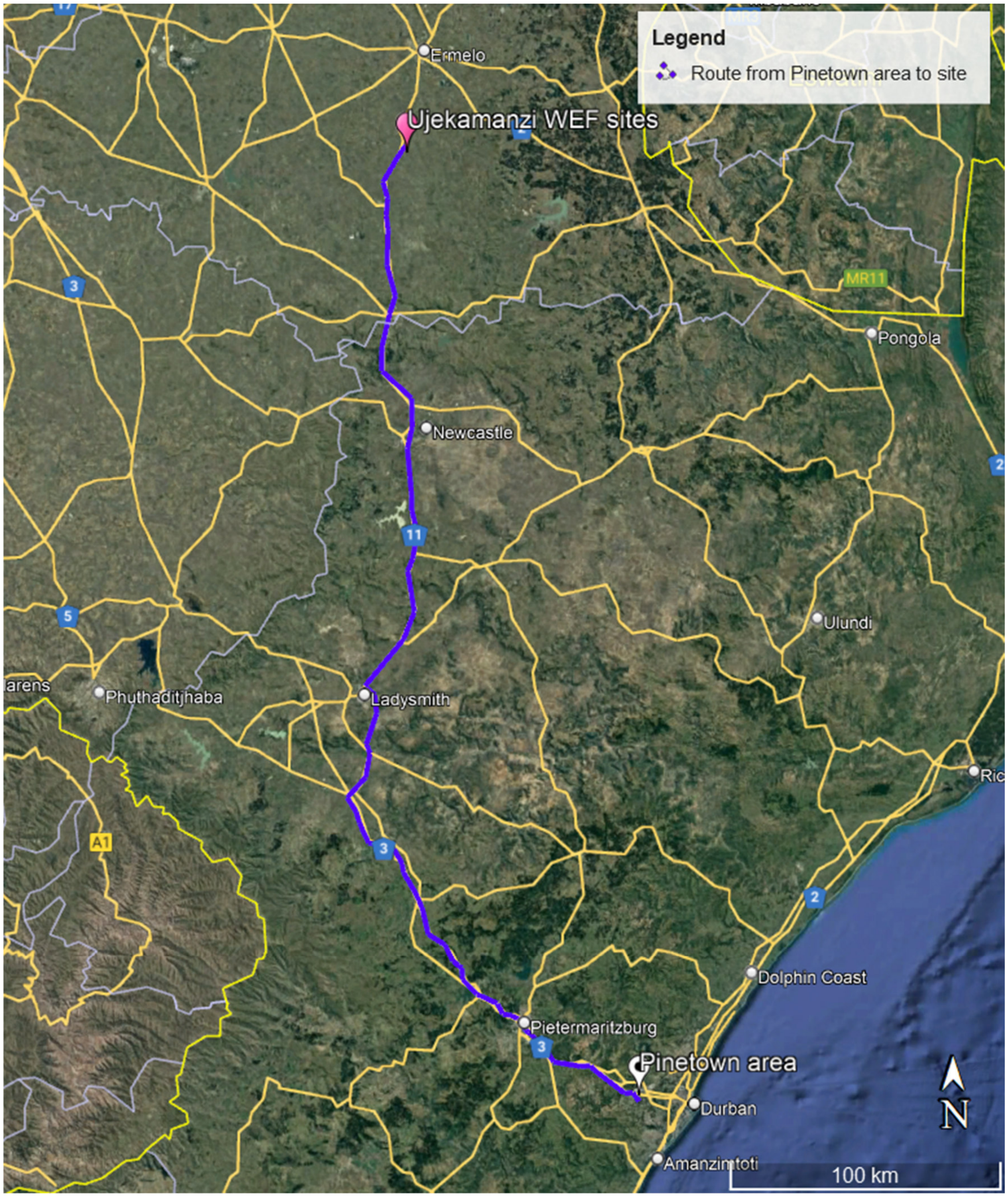

Figure 5-4: Route from Pinetown area to the Ujekamanzi WEF project sites

5.1.2 Surrounding road network

The project site will be located near Ermelo in the Mpumalanga Province. The road classification of the surrounding road network was derived from the *TRH 26 South African Road Classification and Access Management Manual.*

National Route 11 (N11) traverses the western portion of the Ujekamanzi WEF 1 site area (see **Figure 5-5**) and is classified as a Class R1 rural principal arterial, which are principal arterials carrying typically countrywide traffic between:

- Metropolitan areas and large cities (population typically greater than about 500 000);
- Large border posts;
- Other Class 1 Arterials; and
- Smaller centres than the above when travel distances are very long (i.e., longer than 500 km).

Several public roads cross through the project site, which can be classified as Class R3 rural minor arterials, which typically carry inter-district traffic between:

- Small towns, villages and larger rural settlements (population typically less than about 25 000);
- Smaller commercial areas and transport nodes of local importance that generate relatively high volumes of freight and other traffic in the district (public transport and freight terminals, railway sidings, small seaports and landing strips);
- Very small or minor border posts;
- Tourist destinations;
- Other Class 1, 2 and 3 routes.
- Smaller centres than the above when travel distances are relatively long (longer than 50 to 100 km).

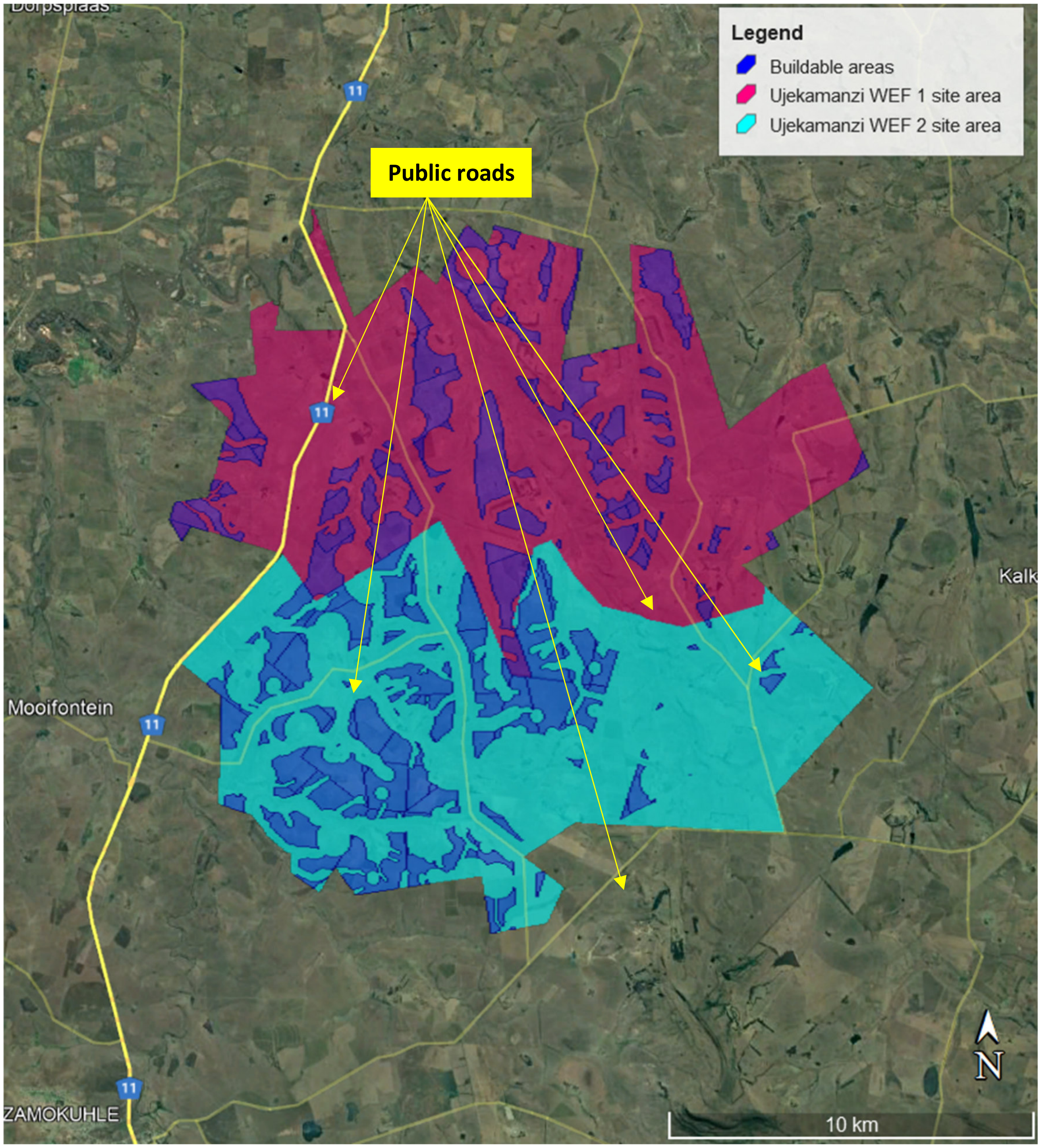

Figure 5-5: Aerial View of external road network

5.1.3 Proposed Access Points

The proposed locations for the MTS and LILO can be approached from several directions and via several routes. The construction vehicles transporting components and equipment for the construction of the electrical infrastructure are recommended to make use of the same access routes as the construction vehicles for the Ujekamanzi WEF 1 and 2 projects.

The access points to the sites will need to be able to cater for construction and abnormal load vehicles. A minimum road width of 10 m for the access point(s) and 5 m for the internal roads is advised. The radius at the access point needs to be large enough to allow for all construction vehicles to turn safely.

All road markings and signage need to be in accordance with the *South African Road Traffic Signs Manual (SARTSM)*. According to the *TRH 17 Geometric Design of rural roads* guideline, the minimum shoulder sight distance at an access point for a Stop condition on a road with a speed limit of 80 km/h (assumed for the public roads), is 330 m for the largest design vehicle (see **Figure 5-6**).

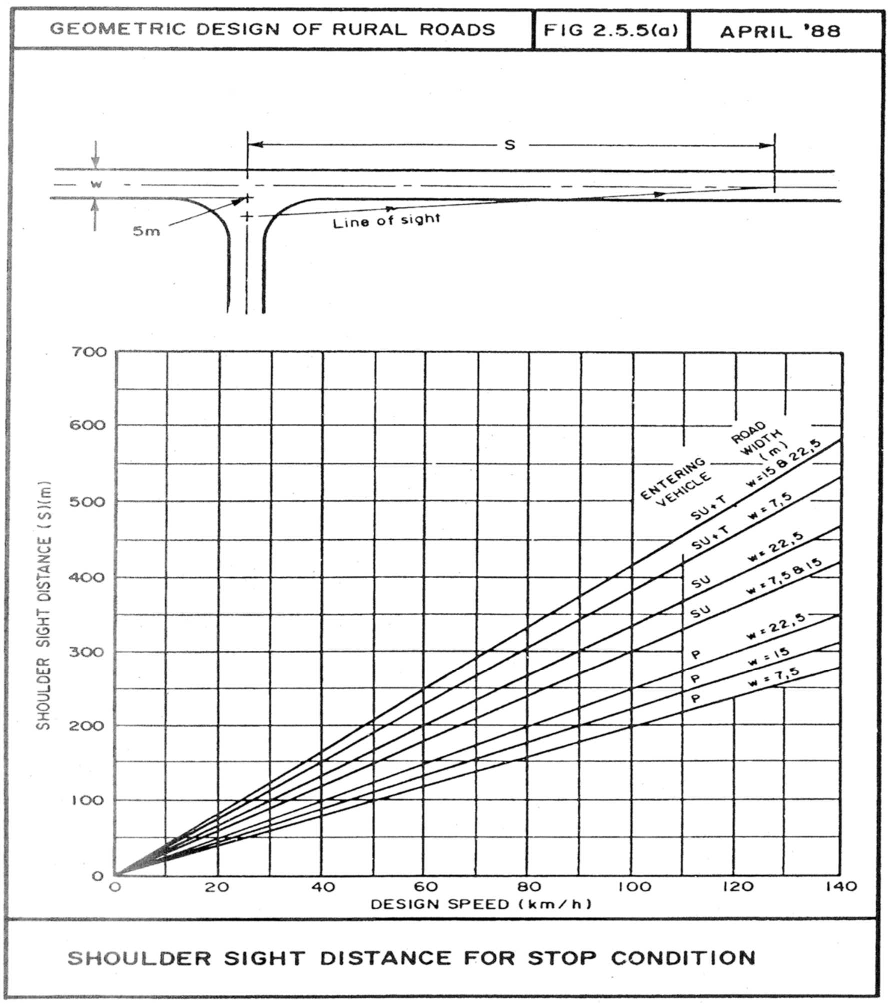

Figure 5-6: TRH17 Geometric Design Guideline – Figure 2.5.5(a)

Possible access options and routes from the N11 towards the proposed MTS and LILO are shown in **Figure 5-7**, keeping in mind minimum required sight distances, access spacing and road safety principles.

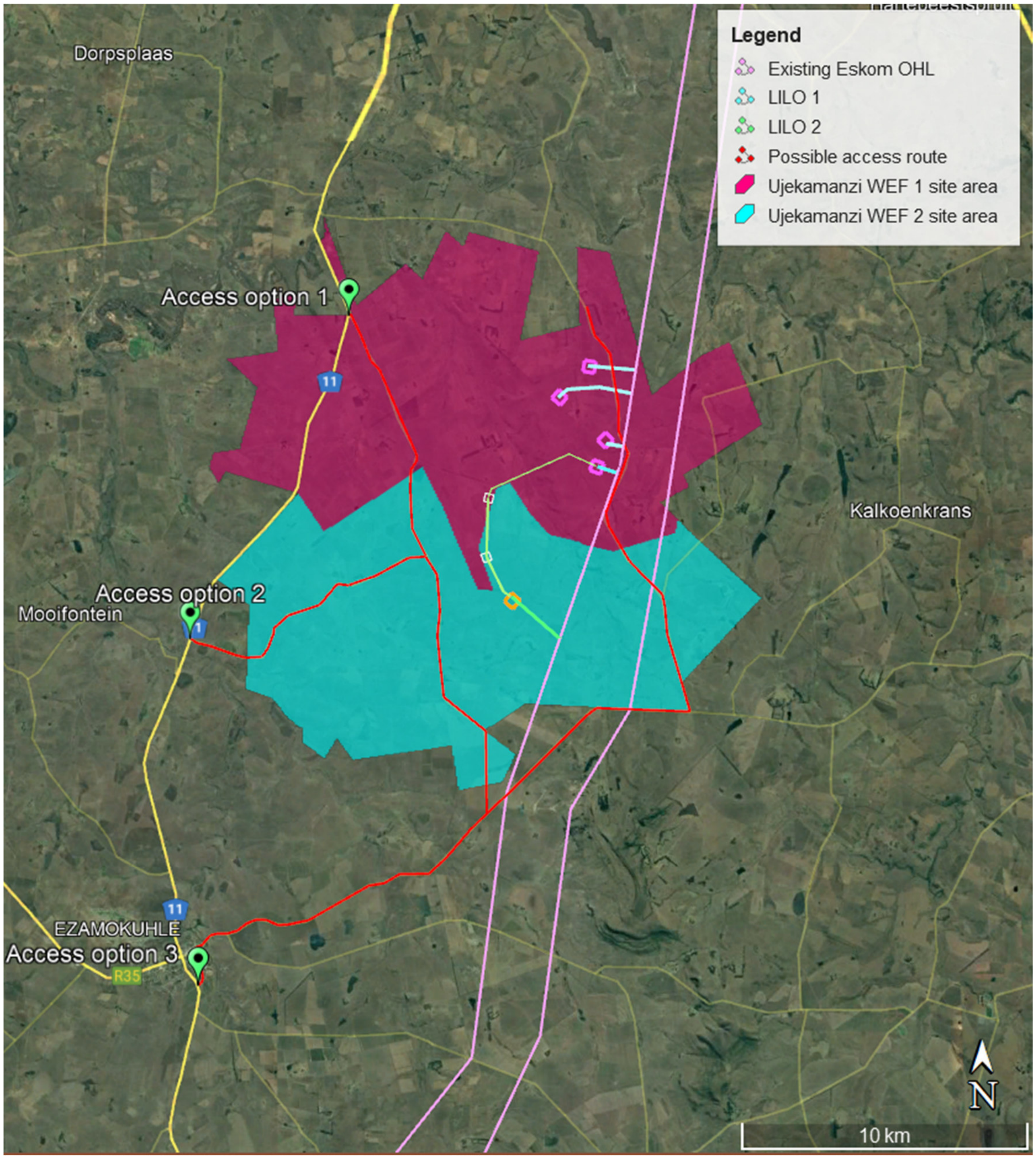

Figure 5-7: Possible access routes

6 ISSUES, RISKS AND IMPACTS

6.1 Identification of Potential Impacts/Risks

The potential transport related impacts during the construction, operational and decommissioning phases are described below. It should be noted that no impacts are anticipated during the planning and design or pre-construction stages of the project.

6.1.1 Construction phase

This phase includes the transportation of construction staff, construction materials and equipment and machinery to the sites. This phase also includes clearing the sites for the pylons/cable tower foundations, construction of footings, hardstand areas, roads, drains and culverts, excavations, trenching and ancillary construction works. This phase will temporarily generate the most development traffic.

1. **Material and component delivery:** Vehicle trips for material and component delivery vary depending on the construction task/program, fuel supply arrangements, as well as distance from the material source to the site. Not enough detail about the MTS and LILO 1 connection is known at this stage to provide an accurate estimated trip generation volume for material and component traffic. However, it is expected that all materials and components can generally be transported by normal heavy load vehicles. Project planning can be utilised to reduce delivery trips during peak hours. In addition to this, the use of mobile batch plants as well as temporary construction material stockpile yards near the proposed sites, can also reduce peak hour trips.
2. **Construction machinery:** Cranes for pylon/tower assembly, heavy vehicles required for earthworks etc. These vehicles are expected to have a negligible impact on traffic generation as they will travel to site (via self-drive or flat-bed delivery vehicles) during establishment and, once on site, will likely only generate internal site traffic with minimal effect on the external road network.
3. **Site personnel and construction staff:** Construction staff will be required for the construction of pylons/towers. It is assumed that they would travel to the site from the nearest towns on a daily basis by busses and minibus taxis, or private vehicles.

Potential impact

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching and ancillary construction works that will temporarily generate the most traffic.

6.1.2 Operational Phase

This phase includes the operation and maintenance of the MTS, pylons/towers and cables of the LILO 1 connection throughout its life span. During operation, it is expected that staff and security will only periodically visit MTS and LILO 1 for maintenance purposes. The traffic generated during this phase will be negligible and will not have an impact on the surrounding road network.

6.1.3 Decommissioning phase

The decommissioning phase will generate construction related traffic including transportation of staff, construction materials, water and equipment. It is therefore expected that the decommissioning phase will generate similar impacts to that of the construction phase.

6.1.4 Cumulative Impacts

To assess a cumulative impact, it is generally assumed that all currently approved and authorized projects within a 30 km radius would be constructed at the same time.

The construction and decommissioning phases of a renewable energy project are the only significant traffic generators. The duration of these phases is short term, i.e., the potential impact of the traffic generated during the construction and decommissioning phases on the surrounding road network is temporary and wind energy projects, when operational, do not add any significant traffic to the road network.

At the time of preparing this report, the project shown in **Figure 6-1** was considered which is a planned solar PV facility of 120 MW at the Majuba Power Station. The estimated development trips are estimated to be around 120, which can be accommodated with recommended mitigation measures.

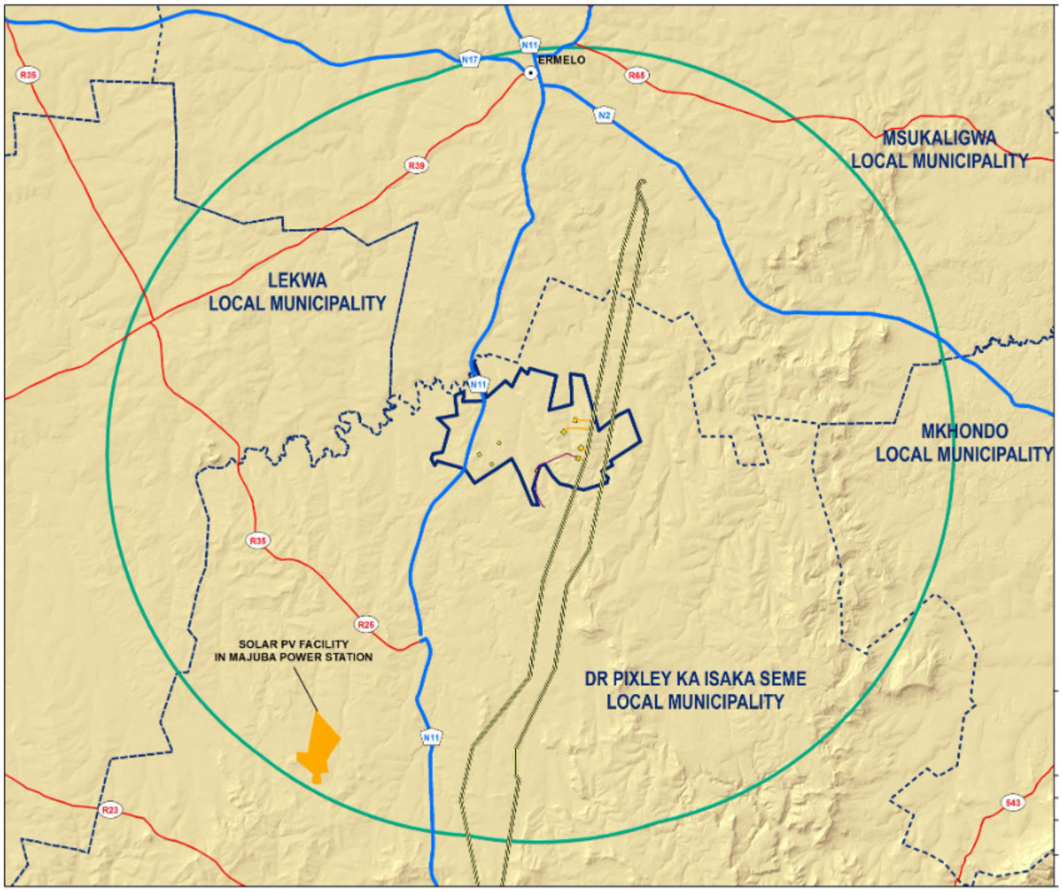

Figure 6-1: Cumulative projects within a 35km radius of the project site

7 IMPACT ASSESSMENT

7.1 Potential Impact (Construction Phase)

7.1.1 Nature of the impact

Potential traffic congestion and delays on the surrounding road network and associated noise and dust pollution.

7.1.2 Significance of impact without mitigation measures

Traffic generated by the construction of the facility will have a significant impact on the surrounding road network. The exact number of trips generated during construction will be determined by the contractor, the haulage company transporting the components to site, the staff requirements and where equipment is sourced from.

7.1.3 Trip Generation – Construction Phase

The number of trips generated during the construction phase varies greatly depending on the number of construction staff, component delivery and contractor's programme. It is, however, estimated that the construction period of the MTS and LILO 1 would be approximately 12 months.

7.1.3.1 Trips resulting from material and component delivery

Actual numbers of construction vehicles are unknown at this time, but it is assumed that the expected maximum trips for the delivery of components and equipment for the MTS and steel sections, concrete for foundations, cables and other pylon/tower components for LILO 1 could be in the order of 10 trips per day, with an additional maximum of 10 trips per day for the importation of wearing course/gravel material for the construction of possible access roads. It is also assumed that one pylon tower will be completed before moving on to the next.

7.1.3.2 Trips resulting from construction machinery

As noted previously, trips generated by construction machinery (e.g., cranes for pylon/tower construction) can be considered negligible as, once established on site, the machinery will likely only generate internal site traffic. As a worst-case scenario, provision is made for 5 trips per day.

7.1.3.3 Trips resulting from site personnel and construction staff

From experience with similar studies, the table below provides an estimate of the number of construction staff/site personnel required during the construction of the MTS and LILO 1.

Table 7-1: Estimated number of construction staff required

Component Name	Estimated duration of construction	Estimated number of construction staff
MTS & LILO 1	~12 months	20

It is estimated that 7% of the construction staff will be classified as Highly skilled labour, while 12% and 81% will be classified as Skilled and Semi-skilled labour, respectively. It is assumed that all Highly skilled and Skilled labour will make use of private vehicles while the majority of semi-skilled labour will travel to site by minibus (can be provided by the Contractor). The above-mentioned split results in the following estimation of daily staff trips for the MTS and LILO 1.

Table 7-2: Estimation of daily staff trips

Vehicle Type	Number of vehicles	Number of Employees
Car	1	1 (assuming 1 occupant)
Bakkie	2	4 (assuming 2 occupant)
Taxi – 15 seats max	2	25
Bus – 60 seats	0	0
Total	**5**	**30**

The total estimated daily site trips for the construction phase are shown in the table below.

Table 7-3: Estimation of daily construction site trips

Trip Origin	Number of trips
Material and component delivery	20
Construction machinery movement	5
Site personnel and construction staff (all components)	5
Total	**30**

The impact on general traffic on the surrounding road network is therefore deemed nominal as the 30 trips will be distributed across a 9 hr working day. The majority of the trips will occur outside the peak hours.

The significance of the transport impact without mitigation measures during the construction phase can be rated as very low. However, considering that this is temporary and short term in nature, the impact can be mitigated to a level that is deemed negligible.

7.1.4 Trip Generation – Operational Phase

Traffic during the operational phase will mostly consist of security and maintenance staff. It should be noted that very limited operational employment opportunities are estimated to be available for the MTS and LILO 1 as ownership of the powerlines will probably be transferred to Eskom following the completion of construction. The operation and maintenance of the lines would be undertaken by Eskom, and it cannot be confirmed at this stage how many people they would need to employ.

At this stage it is estimated that no full-time employees will be stationed at the MTS and LILO 1 and that security and maintenance staff will only periodically inspect the lines and towers and these trips are estimated to have a negligible impact on the external road network.

7.1.5 Trip Generation – Decommissioning Phase

The decommissioning phase will generate construction-related traffic including transportation of people, construction materials, water and equipment. It is therefore expected that the decommissioning phase will generate similar impacts as that of the construction phase.

7.1.6 Proposed general mitigation measures

The following are general mitigation measures to reduce the impact that the additional traffic will have on the road network and the environment.

- The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- Dust suppression of gravel roads located within the site boundary, including the main access roads to the site and the site access roads, during the construction phase, if required.
- Regular maintenance of gravel roads located within the site boundary, including the access roads to the site, by the Contractor during the construction phase and by the Owner/Facility Manager during the operation phase, if required.
- The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network, if available and feasible.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- The Contractor is to ensure that all drivers entering the site adhere to the traffic laws.
- Vehicular movements within the site boundary are the responsibility of the respective Contractor and the Contractor must ensure that all construction road traffic signs and road markings (where applicable) are in place. It should be noted that traffic violations on public roads are the responsibility of Law Enforcement, and the public should report all transgressions to Law Enforcement and the Contractor.
- If required, low hanging overhead lines (lower than 5.1m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved (to be arranged by haulage company and agreed on with the respective service provider of the OHL) to accommodate the abnormal load vehicles. The Contractor and the Developer is to ensure that the haulage company is aware of this requirement. The haulage company is to provide evidence to the Contractor and the Developer that any affected overhead lines have been moved or raised.
- The preferred route should be surveyed to identify problem areas e.g., intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification to ensure that all heavy load vehicles can traverse the route. In the unlikely event that any abnormal load vehicles need to be used to transport any components, it is recommended that a "dry-run" is undertaken after any alterations with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the abnormal load components and the contractor, who will modify the road and intersections. The "dry-run" should be undertaken within the same month components are expected to arrive. The haulage company is to provide evidence that the route has been surveyed and deemed acceptable for the transportation of the abnormal load.
- The Contractor needs to ensure that the gravel sections of the haulage routes (i.e., the site access road and the main access road to the site) remain in good condition and will need to

be maintained during the additional loading of the construction phase and reinstated after construction is completed.

- Design and maintenance of access roads. Where internal roads are damaged as a result of works on the MTS and/or LILO 1, these roads should be repaired. Where any other roads/tracks are required for the purposes of the MTS and/or LILO 1 and are located on the Developer's property, these should be maintained regularly to ensure they remain safe and passable.

7.1.7 Significance of impact with mitigation measures

It should be noted that the construction phase is temporary and short term in nature and the associated impacts can be mitigated to an acceptable level.

The proposed mitigation measures for the construction traffic will result in a reduction of the impact on the surrounding road network and the impact on the local traffic will be very low as the existing traffic volumes are deemed to be low. The dust suppression will result in significantly reducing the impactsite

7.2 Cumulative Impacts

To assess a cumulative impact, it is generally assumed that all wind farms within a 35 km radius, currently proposed and authorized, would be constructed at the same time. This is the precautionary approach as in reality; these projects would be subject to a highly competitive bidding process and not all the projects may be selected to enter into a Power Purchase Agreement. Even if all the facilities are constructed and/or decommissioned at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

The construction and decommissioning phases of a WEF are the only significant traffic generators. The duration of these phases is short term, i.e., the potential impact of the traffic generated during the construction and decommissioning phases on the surrounding road network is temporary and WEFs, when operational, do not add any significant traffic to the road network.

At the time of preparing this report, the projects shown in Error! Reference source not found. were considered in the cumulative impact assessment.

Nature of the impact

- Temporary increase in traffic, noise and dust pollution associated potential traffic

8 NO-GO ALTERNATIVE

The no-go alternative implies that the proposed construction of the MTS and LILO 1 does not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases. However, this would also mean that the Ujekamanzi WEF 1 project cannot proceed. Furthermore, there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its' targets for renewable energy. **Hence, the no-go alternative is not a preferred alternative.**

Table 8-1: Rating of Impacts - Summary Table

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		Extent [E]	Probability [P]	Reversibility [R]	Irreplaceable loss of resources [I]	Duration [D]	Intensity / Magnitude [I / M]	TOTAL	STATUS (+ OR -)	Significance Rating [S]		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	
Construction Phase / Decommissioning Phase																				
Development traffic impact / related noise & dust pollution	Temporary increase in traffic due to construction vehicle trips on the external road network / increase in noise and dust pollution levels during construction period	4	4	1	1	1	1	11	-	Low	Maintenance of haulage routes, dust suppression close to communities, stagger component and materials delivery to site, reduce construction period if possible, use quarries in close proximity to the site. Staff and general trips should occur outside pf peak traffic periods as far as possible.	4	3	1	1	1	1	10	-	Low
Operational Phase																				
Traffic Impact due to maintenance and permanent site staff	Increase in trips on external roads due to maintenance and permanent staff travelling to and from site	2	4	1	1	1	1	9	-	Low	Staff and general maintenance trips to occur outside peak traffic periods as much as possible.	2	3	1	1	1	1	8	-	Low
Cumulative (Construction Phase)																				
Cumulative traffic impacts	Traffic impact due to all planned and approved renewable developments in a 35km radius being developed at the same time	4	4	1	1	1	2	22	-	Low	See construction phase	4	3	1	1	1	2	15	-	Low
Cumulative (Operational Phase)																				
Cumulative traffic impacts	Traffic impact due to all planned and approved renewable developments in a 35km radius being developed at the same time	2	4	1	1	1	2	18	-	Low	See operational phase above.	2	4	1	1	1	1	9	-	Low

9 IMPACT ASSESSMENT SUMMARY

The overall impact significance findings, following the implementation of the proposed mitigation measures, are shown in **Table 9-1** below.

Table 9-1: Overall Impact Significance (Post Mitigation)

Phase	**Overall Impact Significance**
Construction	Negative low
Operational	Negative low
Decommissioning	Negative low
Nature of Impact	**Overall Impact Significance**
Cumulative - Construction	Negative low
Cumulative - Operational	Negative low
Cumulative - Decommissioning	Negative low

10 LEGISLATIVE AND PERMIT REQUIREMENTS

Key legal requirements pertaining to the transport requirements for the proposed WEF development are:

- Abnormal load permits, (Section 81 of the National Road Traffic Act 93 of 1996 and National Road Traffic Regulations, 2000);
- Port permit (Guidelines for Agreements, Licenses and Permits in terms of the National Ports Act No. 12 of 2005); and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

11 CONCLUSION AND RECOMMENDATIONS

The potential traffic and transport related impacts for the construction, operation and decommissioning phases of the proposed MTS and LILO 1 for the Ujekamanzi WEF 1 project were identified and assessed.

- The main impact on the external road network will be during the construction and decommissioning phases. These phases are temporary in comparison to the operational period. No abnormal load vehicles are anticipated (except for one or two trips with mobile cranes when travelling to site), but in case it is necessitated, the resulting trips are expected to be accommodated by the external road network.
- During operation, it is expected that only security and maintenance staff will periodically inspect the lines and towers. The traffic generated during this phase will be negligible and will not have an impact on the surrounding road network.
- The traffic generated during the construction phase, although very low, will be temporary and impacts are considered to be negative and of **negative low significance** after mitigation.

The potential mitigation measures mentioned in the construction and decommissioning phases are:

- Dust suppression of internal gravel roads and the access roads.
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network, if available and feasible.
- Staff and general trips should occur outside of peak traffic periods.
- A "dry run" of the preferred route. Should the haulage company be familiar with the route, evidence is to be provided to the Client and the Contractor.
- Design and maintenance of the internal gravel roads and maintenance of the access roads.
- If required, any low hanging overhead lines (lower than 5.1m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved (to be arranged by haulage company and agreed on with the respective service provider of the OHL) or raised to accommodate the abnormal load vehicles.

The construction and decommissioning phases of the MTS and LILO 1 are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is short term i.e., the impact of the facility on the traffic on the surrounding road network is temporary and the connection, when operational, does not add any significant traffic to the road network.

The development as proposed is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

The potential impacts associated with the proposed Main Transmission Substation (MTS), Loop-In-Loop-Out ("LILO 1") and associated infrastructure are acceptable from a transport perspective.

12 REFERENCES

- Road Traffic Act, 1996 (Act No. 93 of 1996)
- National Road Traffic Regulations, 2000
- SANS 10280/NRS 041-1:2008 - Overhead Power Lines for Conditions Prevailing in South Africa
- Transnetportterminals.net. n.d. *Transnet Port Terminals*. [online] Available at: <https://www.transnetportterminals.net/Ports/Pages/default.aspx>
- 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
- Map from the Eastern Cape Road Asset Management System, Eastern Cape Transport & Public Works, May 2012
- Google Earth Pro Imagery (2022)

Annexure A: Specialist Expertise

SUMMARY OF EXPERIENCE

Iris is a Professional Engineer registered with ECSA (20110156) and obtained her Master of Science degree in Civil Engineering in Germany in 2003. She has more than 20 years of experience in a wide field of traffic and transport engineering projects.

Iris left Germany in 2003 and has gained work experience as a traffic and transport engineer in South Africa and Germany. She has technical and professional skills in traffic impact studies, public transport planning, non- motorised transport planning and design, design and development of transport systems, project planning and implementation for residential, commercial, and industrial projects.

Her passions are the renewable energies and road safety, and she is highly experiences in providing traffic and transport engineering advise.

Iris is registered with the International Road Federation as a Global Road Safety Audit Team Leader and is a regular speaker at conferences, seminars and similar.

PROFESSIONAL REGISTRATIONS & INSTITUTE MEMBERSHIPS

PrEng	Registered with the Engineering Council of South Africa No. 20110156 Registered Mentor with ECSA
MSAICE	Member of the South African Institution of Civil Engineers
ITSSA	Member of ITS SA (Intelligent Transport Systems South Africa)
SAWEA	Member of the South African Wind Energy Association
SARF	South African Road Federation: Committee Member of Council
SARF WR	South African Road Federation Western Region – Chair
SARF RSC	South African Road Federation National Road Safety Committee
IRF	Registered as International Road Safety Audit Team Leader

EDUCATION

1996 – Matric (Abitur)	Carl Friedrich Gauss Schule, Hemmingen, Germany
1998 - Diploma (Draughtsperson)	Lower Saxonian State Office for Road Engineering
2002 – BSc Eng (Civil)	Leibniz Technical University of Hannover, Germany
2003 - MSc Eng (Civil & Transpt)	Leibniz Technical University of Hanover, Germany

Master Thesis on the Investigation of the allocation of access rights *to the European rail network infrastructure - Research of the feasibility of the different bidding processes to allocate access rights of railway operators in the European railway market. Client: Technical University of Berlin and German Railway Company.*

SUMMARY OF EXPERIENCE

iWink Consulting (Pty) Ltd – Independent Consultant

2022 – present
Position: Independent Consultant – working as an independent Specialist in the field of Traffic & Transport Engineering, Renewable Energies and Road Safety.

-

JG Afrika (Pty) Ltd (Previously Jeffares & Green (Pty) Ltd)

2016 – 2022
Position: Associate / Division Head: Traffic & Transport Engineering

Jeffares & Green (Pty) Ltd

2012 – 2016
Position: Senior Traffic & Transport Engineer

Arup (Pty) Ltd

2010 - 2012
Position – Senior Traffic & Transport Engineer

Arup (Pty) Ltd

2004 - 2010
Position – Traffic & Transport Engineer

Schmidt Ingenieursbüro, Hannover, Germany

2000
Position – Engineering Assistant

Leibniz University of Hannover, Germany

2000 - 2003
Position – Engineering Researcher - Institute for Road & Railway Engineering

SELECTION OF PROJECTS

Please note: The below lists show only a *selection* of projects that Iris has been involved in over the last 20 years. More information and a complete Schedule of Experience can be made available on request.

RENEWABLE ENERGY PROJECTS

Transport Impact Assessments /Traffic Management Plans for:

- Selebi Phikwe Solar PV Project, Botswana
- Cradock – Kaladokhwe WEFs
- Britstown WEFs
- Highveld Solar Cluster
- Dealsville & Bloemfontein Solar PV
- Great Karroo Wind and Solar Cluster
- Ummbila Emoyeni Solar Project
- Poortjie Wind&Solar
- Hydra B Solar Cluster
- Choje Windfarm, Eastern Cape
- Richards Bay Gas to Power Project
- Oya Black Mountain Solar Project
- De Aar Solar Project
- Euronotus Wind & Solar Cluster
- Pienaarspoort Wind Energy Project
- Karreebosch Wind Energy Project
- Dyasonsklip Solar Project
- Kuruman Windfarm
- Bloemsmond Solar Farms
- Hendrina Wind Energy Project
- Orkney Solar Project
- Bulskop Solar Project
- Hyperion Solar & Thermal Project
- Gromis & Komas Wind Energy Projects
- Kudusberg & Rondekop Wind Energy Projects
- Bayview Windfarm
- Coega West Windfarm
- Suikerbekkie Solar Project
- Poortjie Solar Project
- Northam Solar Project
- Sibanye Solar Project

- Du Plessis Dam Solar Project
- Mercury Solar Project
- Aberdeen Wind Energy Project
- Saldanha Wind and Solar Projects
- Ummbila Emoyeni Wind Energy Project
- Springhaas Solar Project

Clients:

- G7 Energies
- ABO Wind Renewable Energies
- Atlantic Renewable Energy Partners
- Mulilo
- Acciona
- Enel
- Engie
- DNV GL
- Enertrag
- Scatec Solar
- Red Rocket Energies
- Windlab
- Mainstream
- Africoast
- Genesis

FURTHER PROJECTS

Traffic Impact Studies & Site Development Plan Input:

- Nooiensfontein Housing Development, City of Cape Town
- Belhar Housing Development, City of Cape Town
- Baredale Phase 7, City of Cape Town
- Beau Constantia Wine Farm
- Constantia Glen Wine Farm
- Eagles Nest Wine Farm
- Groenvallei Parking Audit, City of Cape Town
- Kosovo Housing Development, Western Cape Government
- Enkanini Housing Development, Stellenbosch
- Delft Housing Development, City of Cape Town
- Secunda Sasol, Free State
- Marula Platinum Mine
- InnerCity Transport Plan, City of Cape Town
- Stellenbosch Road Master Plan
- Nyanga Public Transport Interchange
- Crawford Campus Cape Town
- Durban RoRo Car Terminal, Transnet
- Durban Farewell Container Site

- Msunduzi Waterfront Housing Development
- Transnet Park Site – Traffic Management and Evacuation Plans
- UWC Bellville Medical Campus
- Bloekombos District Hospital
- Malabar Extension 3, Port Elizabeth

Traffic Engineering for Roads Projects:

- Namibia Noordoewer to Rosh Pina, Road Agency Namibia
- N2 Section 19 Mthatha – NMT Studies
- R63 Alice to Fort Beaufort – NMT, Road Link and Intersection Studies
- N2 Kangela to Pongola Upgrade
- Cofimvaba Eastern Cape – NMT, Road and Intersection Upgrades
- Stellenbosch R44 Traffic Signals
- Secunda Traffic Signals
- Fezile Dabi District Gravel Roads Upgrade, Free State Province
- Zambia RD Rehabilitation Project
- R61 Eastern Cape – NMT Studies, SANRAL

CONTINUED PROFESSIONAL DEVELOPMENT (CPD)

*Last five years*full CPD list available*

2023 – International Traffic Safety Conference, Doha – Speaker

2022 – 7th Regional Conference for Africa & PIARC International Seminar on Rural Roads and Road Safety - Speaker

2022 – Non-motorised Transport Seminar (SARF) – Co-Organizer / Speaker

2021 – SARF KZN Road Safety Considerations (SARF) – Guest Speaker

2021 – Road Safety Audit Course (IRF) – Guest Speaker

2021 – Legal Obligations / Road Safety Act (SARF) – Presenter

2020 – Understanding Road Accidents (SARF)

2020 – Road Safety Auditor Course (SARF) – Co-Lecturer

2018 – African Road Conference (IRF/SARF/PIARC)

2018 – Road Safety in Engineering (SARF) – Presenter

2016 - SATC Road Safety Audit Workshop Pretoria (SARF)

2015 - Non-motorised Transport Planning (SARF

Annexure B: Specialist Statement of Independence

I, Iris Sigrid Wink, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations, and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist: ________________________

Name of Company: iWink Consulting (Pty) Ltd

Date: 18/04/2023

Annexure C: Impact Assessment Methodology

1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

1.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e. site, local, national or global), whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in **Table 1**.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

1.2 Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the various project stages, as follows:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

The significance of Cumulative Impacts should also be rated (As per the Excel Spreadsheet Template).

1.2.1 Rating System Used to Classify Impacts

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 1: Rating of impacts criteria

<table>
<tr><th colspan="3">ENVIRONMENTAL PARAMETER</th></tr>
<tr><td colspan="3">A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).</td></tr>
<tr><th colspan="3">ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE</th></tr>
<tr><td colspan="3">Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).</td></tr>
<tr><th colspan="3">EXTENT (E)</th></tr>
<tr><td colspan="3">This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.</td></tr>
<tr><td>1</td><td>Site</td><td>The impact will only affect the site</td></tr>
<tr><td>2</td><td>Local/district</td><td>Will affect the local area or district</td></tr>
<tr><td>3</td><td>Province/region</td><td>Will affect the entire province or region</td></tr>
<tr><td>4</td><td>International and National</td><td>Will affect the entire country</td></tr>
<tr><th colspan="3">PROBABILITY (P)</th></tr>
<tr><td colspan="3">This describes the chance of occurrence of an impact</td></tr>
<tr><td>1</td><td>Unlikely</td><td>The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).</td></tr>
<tr><td>2</td><td>Possible</td><td>The impact may occur (Between a 25% to 50% chance of occurrence).</td></tr>
<tr><td>3</td><td>Probable</td><td>The impact will likely occur (Between a 50% to 75% chance of occurrence).</td></tr>
<tr><td>4</td><td>Definite</td><td>Impact will certainly occur (Greater than a 75% chance of occurrence).</td></tr>
<tr><th colspan="3">REVERSIBILITY (R)</th></tr>
<tr><td colspan="3">This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.</td></tr>
<tr><td>1</td><td>Completely reversible</td><td>The impact is reversible with implementation of minor mitigation measures</td></tr>
<tr><td>2</td><td>Partly reversible</td><td>The impact is partly reversible but more intense mitigation measures are required.</td></tr>
<tr><td>3</td><td>Barely reversible</td><td>The impact is unlikely to be reversed even with intense mitigation measures.</td></tr>
<tr><td>4</td><td>Irreversible</td><td>The impact is irreversible and no mitigation measures exist.</td></tr>
<tr><th colspan="3">IRREPLACEABLE LOSS OF RESOURCES (L)</th></tr>
<tr><td colspan="3">This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.</td></tr>
<tr><td>1</td><td>No loss of resource.</td><td>The impact will not result in the loss of any resources.</td></tr>
<tr><td>2</td><td>Marginal loss of resource</td><td>The impact will result in marginal loss of resources.</td></tr>
<tr><td>3</td><td>Significant loss of resources</td><td>The impact will result in significant loss of resources.</td></tr>
<tr><td>4</td><td>Complete loss of resources</td><td>The impact is result in a complete loss of all resources.</td></tr>
<tr><th colspan="3">DURATION (D)</th></tr>
<tr><td colspan="3">This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.</td></tr>
</table>

1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE (S)		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula: **Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.**		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

The table below is to be represented in the Impact Assessment section of the report. The excel spreadsheet template can be used to complete the Impact Assessment.