

BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces
DRAFT BASIC ASSESSMENT REPORT



Prepared for: South Africa Mainstream
Renewable Power Developments (Pty) Ltd
CSIR Report No.: CSIR/SPLA/EMS/ER/2019/0054/B

October 2019

Basic Assessment Process

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report details

Title:	Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces: DRAFT BASIC ASSESSMENT REPORT
Purpose of this report:	<p>This Basic Assessment (BA) Report has been compiled as part of the Environmental Authorisation Process for the proposed construction of Electrical Grid Infrastructure to support the authorised Sutherland, Sutherland 2 and Rietrug WEFs in the Northern and Western Cape Provinces of South Africa. The purpose of this BA Report is to:</p> <ul style="list-style-type: none"> • Present the proposed project and the need for the proposed project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the proposed project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and • Provide a Project Specific Environmental Management Programme (EMPr) for the proposed project. <p>This Draft BA Report is being made available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period. All comments submitted during the 30-day review of this Draft BA Report will be incorporated into a finalised BA Report, as applicable and where necessary. The finalised BA Report will then be submitted to the National Department of Environment, Forestry and Fisheries (DEFF), in accordance with Regulation 19 (1) of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations (as amended), for decision-making in terms of Regulation 20 of the 2014 NEMA EIA Regulations, as amended.</p> <p>The proposed project is located within the Central Power Corridor that was assessed as part of the 2016 Strategic Environmental Assessment (SEA) on Electricity Grid Infrastructure and subsequently gazetted for implementation in February 2018. As such, the proposed project will take place within a strategic geographical area, wherein Applications for Environmental Authorisation for large-scale Electrical Grid Infrastructure will be subjected to a BA Process and a reduced decision-making timeframe of 57 days.</p>
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contents

SECTION A	Introduction, Project Description and Legislative Review
SECTION B	Description of the Affected Environment
SECTION C	Public Participation
SECTION D	Impact Assessment
SECTION E	Recommendation of the Environmental Assessment Practitioner
SECTION F	Appendices

APPENDICES

Appendix A	Maps
Appendix B	Photographs
Appendix C	Facility Illustrations
Appendix D	Specialist Reports (including Terms of Reference)
Appendix E	Public Participation
Appendix F	Environmental Management Programme (EMPr)
Appendix G	Details of EAP and Expertise
Appendix H	Specialist's Declaration of Interest
Appendix I	Additional Information

tables

Table 1:	The BA Team	31
Table 2:	Scope of the BA Process	32
Table 3:	Summary of Specifications of the proposed Electrical Grid Infrastructure Project	35
Table 4:	Applicable Listed Activities	51
Table 5:	Assessment undertaken in previous BAs for Electrical Grid Infrastructure for Alternative 1 and Alternative 2 power line routing (CSIR, 2017)	59
Table 6:	Summary of Ranking and Assessment of Routing Options that were previously considered for Alternative 2 of the Proposed Distribution Line and Service Road during the previous BA Process	62
Table 7:	Requirements of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) in terms of Alternatives	67
Table 8:	List of Questions to determine the Need and Desirability of the Proposed Project	70
Table 9:	Legislation Applicable to the Proposed Project	78
Table 10:	Details of the Affected Properties	83
Table 11:	Habitat Condition on Site	91
Table 12:	Site Notice Boards Placed for the Commencement of the BA Process	106
Table 13:	Projects considered as part of the cumulative impact assessment that occur within 30 - 50 km of the site	112

figures

Figure 1:	Proposed Locality of the Electrical Grid Infrastructure, and Affected and Adjacent Farm Portions.	26
Figure 2:	A) Proposed Electrical Grid Infrastructure connecting the proposed Sutherland, Sutherland 2 and Rietrug WEFs to an existing Eskom 400 kV power line. B) Proposed Service Road Deviation.	27
Figure 3:	A) Summary of the Amendments to the EAs of the WEFs. B) Proposed Locality of the Authorised Sutherland, Sutherland 2 and Rietrug WEFs.	29
Figure 4:	Different types of towers (Images: ECVV.com and Eskom)	33
Figure 5:	Ecological Sensitivity Map for the proposed Electrical Grid Infrastructure Project.	39
Figure 6:	Locality Map of the proposed Electrical Grid Infrastructure relative to Freshwater Features present.	41
Figure 7:	Environmental Sensitivities Map – Aquatic Ecology	42
Figure 8:	Viewshed of the proposed Power Line Routing	43
Figure 9:	Environmental Sensitivities Map – Visual	44
Figure 10:	Google earth satellite image of part of Hamel Kraal Farm 16 showing the location of an extensive surface scatter of petrified wood plus occasional bone fragments either side of a farm track (Locs. 041- 074). The yellow polygon outlines a c. 30-m wide peripheral buffer zone around the fossil scatter. The black line c. 500 m to the northeast shows the 132 kV transmission line route.	45
Figure 11:	Overview of the heritage sites within 500 m of the power line route that should be protected and avoided.	46
Figure 12:	A) Three archaeological sites that should be avoided in Northern Cape (waypoints 524, 546, and 51). The 30 m buffer is only shown on the one that may need active monitoring by the Environmental Control Officer. B) Three archaeological sites that must be avoided in the north-eastern part of the Western Cape section of the route. 30 m buffers are shown on the two ruined historical complexes. The brown line shows the route that will be followed by the service road in that area.	47
Figure 13:	Environmental Sensitivities Map - Heritage	48
Figure 14:	Sensitive areas from an avifaunal impact perspective for the proposed Electrical Grid Infrastructure BA	49
Figure 15:	A) Previously authorised “Alternative 1” Power Line Routing shown in blue and currently assessed power line routing shown in red (previously assessed “Alternative 2”) and green. B) Five Options considered in the initial BAs for the routing of the proposed power line for Alternative 2 from the Sutherland on-site substation to the Eskom Nuwerust Substation (CSIR, 2017).	60
Figure 16:	Gazetted power corridors as identified in the Electrical Grid Infrastructure SEA (CSIR, 2016)	71
Figure 17:	REDZs identified in the SEA (Phase 1(REDZ 1: Overberg; REDZ 2: Komsberg; REDZ 3: Cookhouse; REDZ 4: Stormberg; REDZ5: Kimberley; REDZ 6: Vryburg; REDZ 7: and Upington; REDZ 8: Springbok) (CSIR, 2015). The proposed project falls within the REDZ 2: Komsberg.	72
Figure 18:	Vegetation map of the power line routing, including the substation site and the 400 kV section to the existing Eskom Grid (Todd, 2019).	86
Figure 19:	Critical Biodiversity Areas and Ecological Support Areas for the study area, which is based on the CBA map for the Northern Cape and the Western Cape BSP for the Laingsburg District.	89

Figure 20: The 2017 Western Cape Biodiversity Spatial Plan for Witzenberg Municipality (CapeFarmMapper, 2019).	90
Figure 21: Percentage Distribution of Population per Population Group for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).	95
Figure 22: Percentage Distribution of Population per Population Group for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).	96
Figure 23: Employment Status for the 15 – 64 Age Group of the Karoo Hoogland Local Municipality based on the 2011 Census Data (Statistics SA, 2017).	97
Figure 24: Employment Status for the 15 – 64 Age Group of the Laingsburg Local Municipality based on the 2011 Census Data (Statistics SA, 2017).	98
Figure 25: Average Household Income Distribution of the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).	99
Figure 26: Annual Income Category of Agricultural Household Heads for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).	99
Figure 27: Agricultural Households and Type of Activity for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).	100
Figure 28: Average Household Income Distribution of the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).	101
Figure 29: Annual Income Category of Agricultural Household Heads for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).	101
Figure 30: Agricultural Households and Type of Activity for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).	102
Figure 31: Education Levels of the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).	103
Figure 32: Education Levels of the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).	103
Figure 33: PPP for the Proposed Construction and Operation of EGI to support the Sutherland, Sutherland 2 and Rietrug WEFs Electrical Grid Infrastructure BA Project	105
Figure 34: Map of proposed Renewable Energy and Electrical Infrastructure projects considered for the Cumulative Impact Assessment	117
Figure 35: Guide to assessing risk/impact significance as a result of consequence and probability.	119
Figure 36: Combined Environmental Sensitivities Map	163

executive summary

Introduction, Background and Environmental Assessment Process

South Africa Mainstream Renewable Power Developments (PTY) Ltd (herein-after referred to as Mainstream) is proposing the development of a 132 kV power line, a 400 kV power line and a 400 kV Major Transmission Substation (MTS) near Sutherland in the Northern and Western Cape. The proposed power lines are required to distribute electricity generated by the proposed Rietrug Wind Energy Facility (WEF), the Sutherland WEF and the Sutherland 2 WEF (herein-after referred to as WEFs) to the national grid. These WEFs received EAs dated 10 November 2016 (Department of Environmental Affairs (DEA) Reference Numbers: 12/12/20/1782/1; 12/12/20/1782/2; and 12/12/20/1782/3, respectively), from the National DEA. Two subsequent applications for substantive amendment have been approved by DEA (now operating as the Department of Environment, Forestry and Fisheries (DEFF)). A third application for substantive amendment is currently being undertaken by the CSIR to change turbine specifications (i.e. amend the turbine hub height and rotor diameter), and the contact details of the holder of the Environmental Authorisations.

The proposed 132 kV power line occurs in the Northern Cape Province, approximately 23 km south of Sutherland and 50 km north of Laingsburg, under the jurisdiction of the Namakwa District Municipality and the Karoo Hoogland Local Municipality. The power line routing also extends into the Western Cape Province, under the jurisdiction of the Central Karoo District Municipality and the Laingsburg Local Municipality.

The proposed Electrical Grid Infrastructure includes service roads, a laydown area and Operational and Maintenance (O&M) building covering a total project area of approximately 16 ha.

The farms and farm portions which will be affected by the proposed power line are listed below:

Northern Cape Farm Portions	Western Cape Farm Portions
Remaining Extent of Beeren Valley Farm 150	Remaining Extent of Farm 280
Remaining Extent of Nootgedacht Farm 148	Portion 1 of Rheebockenfontein Farm 4
Remaining Extent of Hartebeeste Fontein Farm 147	Portion 2 of Rheebockenfontein Farm 4
Portion 1 of Farm 219	Portion 2 of Farm De Molen 5
Remaining Extent of Farm 219	Portion 6 of Farm Hamelkraal 16
	Portion 7 of Farm Hamelkraal 16
	Remaining Extent of Spitskop Farm 20

It should be noted that this BA covers the proposed 132 kV power line routing from the authorised Sutherland on-site substation to the proposed 400 kV MTS and the subsequent routing to the existing 400 kV Eskom power line via a proposed 4 km long 400 kV power line. The proposed 132 kV power line routing from the Sutherland 2 on-site substation to the Sutherland on-site substation has been assessed and approved as part of a separate BA that was undertaken in 2017. This project received Environmental Authorisation in February 2018.

The 132 kV line routing proposed as part of this application has been previously assessed as part of the proposed construction of the Electrical Grid Infrastructure for the Sutherland 2 WEF (14/12/16/3/3/1/1814/AM1), Rietrug WEF (14/12/16/3/3/1/1815) and Sutherland WEF (14/12/16/3/3/1/1816). The electrical infrastructure project for the Rietrug and Sutherland 2 WEFs received EAs in February 2018. The electrical infrastructure project for the Sutherland WEFs received EA in March 2018. Currently a joint BA process is undertaken instead of three separate BAs for each proposed WEF as undertaken in the initial BAs (CSIR, 2017).

Project Description

The Electrical Grid Infrastructure project (i.e. this BA process) includes the following:

- Overhead 132 kV power line, extending approximately 41 km in length, from the authorised Sutherland WEF on-site substation to the MTS (including tower/pylon infrastructure and foundations). This line has been assessed as part of a previous BA process and was referred to in the initial BA reports as “Alternative 2”;
- Overhead 400 kV transmission line, extending approximately 4 km in length, connecting to an existing 400 kV Eskom line;
- MTS on-site (400 m x 400 m; including Operation and Maintenance (O&M) building and laydown area);
- Fencing of the proposed on-site substation; and
- Service roads will be constructed below the lines (jeep track).

Project BA Team

As mentioned above, the CSIR has been appointed to undertake the separate BA Processes. The project team, including the relevant specialists, are indicated in the table below:

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
CSIR Project Team		
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Minnelise Levendal	CSIR	Project Leader (<i>Pr. Sci. Nat.</i>)
Rohaida Abed	CSIR	Project Manager (<i>Pr. Sci. Nat.</i>)
Specialists		
Simon Todd	3Foxes Biodiversity Solutions	Terrestrial Ecology Impact Assessment
Antonia Belcher and Dana Grobler	BlueScience	Aquatic Ecology (Freshwater) Impact Assessment
Scott Masson	SRK Consulting	Visual Impact Assessment
Dr. Jayson Orton and Dr. John Almond	ASHA Consulting (Pty) Ltd and Natura Viva cc	Heritage Impact Assessment: (Palaeontology, Archaeology and Cultural Landscape)
Chris van Rooyen and Albert Froneman	Chris van Rooyen Consulting	Bird Impact Assessment
Johann Lanz	Private	Agricultural Impact Assessment

National Planning Initiatives

The DEA commissioned a Strategic Environmental Assessment (SEA) for Electrical Grid Infrastructure to assist Eskom with identifying priority corridors and to improve environmental regulatory processes inside the corridors in support of Strategic Infrastructure Project (SIP) 10. The final Power Corridors assessed as part of the 2016 Electricity Grid Infrastructure SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 113. The proposed Electrical Grid Infrastructure project falls within the Central Power Corridor included in the Electrical Grid Infrastructure SEA. As such a BA is required, as opposed to a full Scoping and EIA Process, which is required for all activities listed in Listing Notice 2. The decision-making timeframe has also been reduced from 107 days to 57 days (more details are provided in Section A.7 of this BA report).

The proposed project also falls within the Renewable Energy Zone (REDZ) 2 (i.e. Komsberg REDZ). The eight REDZs that were assessed as part of the 2015 Wind and Solar Phase 1 SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 114. The REDZs were identified in five provinces, namely the Eastern Cape, Western Cape, Northern Cape, Free State and North West.

This project relates to the development of Electricity Grid Infrastructure to support the proposed WEFs. Therefore, the development of Electricity Grid Infrastructure serves as the subject of this Application of Environmental Authorisation. The proposed project is in line with national planning initiatives to support and promote sustainable development.

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the applicant has appointed the CSIR (Minnelise Levendal) to undertake the BA Process in order to determine the biophysical, social and economic impacts associated with undertaking the proposed activity. The BA team also includes various specialists that have been appointed to undertake specialist studies to contribute to the BA Process. These specialist studies are included in Appendix D of the BA Report.

Need for the BA

Section 24(1) of the NEMA states: "In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant environmental authorisation." The reference to "listed activities" in Section 24 of the NEMA relates to the regulations promulgated in Government Notice (GN) R326, R327, R325 and R324, dated 7 April 2017. The relevant GN published in terms of the NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a BA or Scoping and EIA be conducted. As noted above, the proposed project requires a BA Process.

As noted above, the proposed project falls within the REDZ 2 (i.e. Komsberg) and the Central Power Corridor. Developers proposing to submit applications for Environmental Authorisation for large scale electricity transmission infrastructure within any of the five Strategic Transmission Corridors, that trigger Listed Activity 9 of Listing Notice 2 of the 2014 EIA Regulations, as amended, or any other listed and specified activities that are necessary for the realisation of such infrastructure and facilities, would need to follow a BA process in terms of the 2014 EIA Regulations, as amended, as opposed to a full Scoping and EIA Process, which is required for all activities listed in Listing Notice 2. **The decision-making timeframe has also been reduced from 107 days to 57 days.**

Therefore, since the proposed project falls within the Central Power Corridor, based on the above, the Mainstream electrical infrastructure project is subject to a BA Process.

Table 4 in Section A.7 of the report provides a list of the applicable listed activities associated for the proposed project in terms of Listing Notice 1 (GN R 327), Listing Notice 2 (GN R 325) and Listing Notice 3 (GN R324) in terms of the 2014 NEMA EIA Regulations, as amended.

The Application for Environmental Authorisation for this BA process will be submitted to the DEFF together with this Draft BA Report, which makes reference to all relevant listed activities forming part of the proposed development.

Project Alternatives

It is important to note that the location of the proposed power line and service roads, as well as the other associated infrastructure, is dictated by and dependent on the location of the proposed and authorised WEFs, and therefore certain alternatives are not applicable or feasible, as discussed and motivated further below.

The main factors that determined the location of the proposed 132 kV and 400 kV power lines and supporting electrical infrastructure are indicated below:

- Location of the proposed and authorised WEFs that will be connected to the national grid via the proposed supporting electrical infrastructure;
- Location of the proposed MTS;
- Cooperative landowners; and
- Environmental sensitivities identified by the specialists.

In the previous BA reports for the proposed electrical infrastructure for the Rietrug, Sutherland and Sutherland 2 WEFs (CSIR, 2017) two alternative power line routings were assessed by the specialists, i.e. Alternative 1 and Alternative 2. Alternative 1 of the grid connection was to route to the proposed 132 kV Suurplaat on-site

substation (referred to as the proposed collector hub), located on the Farm Hartebeeste Fontein in the Northern Cape. There were no fatal flaws associated with Alternative 1 and it was selected as the preferred alternative (CSIR, 2017). Alternative 2 was also assessed as part of the BA Processes. Alternative 2 of the grid connection was to route to the proposed 400 kV Eskom Main Transmission Substation (also known as the proposed Eskom Nuwerust Substation), located on Farm Hamelkraal in the Western Cape. Alternative 2 is currently the preferred routing option for this BA.

Alternative 1 was approved in the EA in February 2018. However, Alternative 2 of the grid connection routing was also deemed acceptable, and it did not present any environmental fatal flaws, as summarised in Section A.8 of the BA Report. Alternative 2 was also deemed as a technically feasible option to enable the evacuation of the electricity generated by the abovementioned WEFs into the National Grid.

The main reason for seeking EA for the Alternative 2 previously assessed route is because the connection to the proposed 132 kV Suurplaat on-site substation (Alternative 1) is not favoured because this substation has not yet been constructed, and it forms part of another proposed third-party wind farm development that also has not been constructed yet. Mainstream will therefore be dependent on the third-party receiving Environmental Approval and preferred bidder status before constructing the necessary electrical grid infrastructure to support to the proposed Sutherland, Sutherland 2 and Rietrug WEFs. Mainstream also does not have land control to allow this connection. Hence, the need for Alternative 2 (as previously assessed) has been put forward for approval in this BA Process.

It must be re-iterated that both alternatives assessed as part of the CSIR 2017 BAs were acceptable and did not display any environmental fatal flaws.

Based on the above, site alternatives and power line routing options for this proposed BA project are not applicable and were not assessed as part of this BA process. Alternatives that were included and assessed in this BA include alternative types of activities for the generation of electricity, turbine technology alternatives and the no-go option.

Impact Assessment

Six specialist studies were carried out as part of the BA Process. These included:

- Terrestrial Ecology Impact Assessment;
- Aquatic Ecology (Freshwater) Impact Assessment;
- Visual Impact Assessment;
- Heritage Impact Assessment (Palaeontology, Archaeology and Cultural Landscape);
- Avifauna Impact Assessment; and
- Agricultural Impact Assessment.

Terrestrial Ecology Impact Assessment:

A Terrestrial Ecology Impact Assessment (Appendix D.1 of the BA Report) has been undertaken in order to provide supporting information relating to terrestrial ecological features and associated impacts, in terms of the proposed construction of the electrical infrastructure. The ecological study incorporated desktop and site investigation of the affected area.

The following potential direct terrestrial ecological impacts associated with the proposed Electrical Grid Infrastructure development have been identified:

- **Construction Phase:**
 - Habitat loss and impact on plant Species of Conservation Concern (SCC) as a result of clearing of vegetation;
 - Impact on fauna due to habitat loss and disturbance, as a result of increased levels of noise, pollution, disturbance and human presence; and
 - Habitat loss within Critical Biodiversity Areas (CBAs) as a result of clearing of vegetation and construction phase disturbance.
- **Operational Phase:**
 - Impact on fauna as a result of operational phase activities; and
 - Increased soil erosion during operations due to construction phase disturbance (following the completion of the construction phase), as well as maintenance activities.

- **Decommissioning Phase:**
 - Impact on fauna as a result of increased levels of noise, pollution, disturbance and human presence during decommissioning activities;
 - Increased soil erosion due to decommissioning disturbance; and
 - Increased alien plant invasion due to decommissioning phase disturbance.

The Terrestrial Ecology Impact Assessment explains that the proposed Electrical Grid Infrastructure project is considered acceptable and would generate low post-mitigation impacts on terrestrial fauna and flora. There are no specific long-term impacts likely to be associated with the proposed project that cannot be reduced to a low significance. The contribution of the proposed power line, service road and MTS components to cumulative impact in the area would be low and is considered acceptable. As such, there are no fatal flaws associated with the proposed development and no terrestrial ecological considerations that should prevent it from proceeding.

A number of management recommendations have been proposed in order to mitigate potential impacts on the terrestrial environment that may arise during the construction, operational and decommissioning phases of the proposed project, as indicated below:

- Minimise the development footprint within areas of high fauna importance such as rocky outcrops and drainage lines.
- Minimise the development footprint within CBAs as much as possible and ensure that any disturbed areas are rehabilitated after construction.
- The final location of the pylons should be verified in the field before construction during the final walk-through of the power line to ensure that these are positioned so as to minimise the impact of the power line on species and habitats of conservation concern.
- Search and rescue should be undertaken for reptiles and other vulnerable species during construction, before vegetation clearance.
- Any fauna threatened by the construction activities should be moved to safety by the appointed Environmental Control Officer (ECO) or appropriately qualified environmental officer.
- All construction vehicles should adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.

Aquatic Ecology (Freshwater) Impact Assessment:

An Aquatic Ecology (Freshwater) Impact Assessment specialist study (Appendix D.2 of this BA Report) was undertaken as part of the BA Process to define the ecology of the study area in terms of riparian and other freshwater resources associated with the proposed development within the investigation area, in order to provide supplementary, detailed information to guide the activities associated with the proposed development, to ensure the ongoing functioning of the freshwater ecosystems in such a way as to support local and regional conservation requirements, and the provision of ecological services in the local area.

The following potential aquatic ecological impacts associated with the proposed Electrical Grid Infrastructure development have been identified:

- **Construction Phase:**
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat as a result of construction activities in or adjacent to aquatic features for the substation, transmission line and service road construction.
 - Indirect Impacts:
 - Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems (i.e. construction activities for the substation, transmission line and service road construction).
- **Operational Phase:**
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat and modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems.
 - Indirect Impacts:
 - Invasive alien plant growth in riparian zones and potential for erosion of watercourses due to the disturbance of aquatic habitat and modification of runoff characteristics.

- **Decommissioning Phase:**
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat as a result of decommissioning activities in or adjacent to aquatic features for the substation, transmission line and service road construction.
 - Indirect Impacts:
 - Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems.
 - Invasive alien plant growth and potential for erosion of watercourses due to the disturbance of aquatic vegetation.

The following cumulative impact was also identified:

- Cumulative impact of the proposed projects on freshwater ecosystems including disturbance activities within watercourses of the area; use of water and possible modification and contamination of runoff.

Overall, the construction and decommissioning phase direct and indirect impacts were rated with a moderate to low significance (without the implementation of mitigation measures) and reduced to a low to very low significance with the implementation of mitigation. The direct and indirect impacts identified for the operational phase were rated with a moderate significance without mitigation, and low significance with mitigation. The cumulative impacts identified were rated with a low significance both without and with mitigation.

Based on the findings of the assessment, the specialist has confirmed that there is no reason, from a freshwater perspective, why the proposed activity (with implementation of the recommended mitigation measures) should not be authorized.

The following main mitigation measures were identified in the Aquatic Ecology (Freshwater) Impact Assessment specialist study:

- Ensure the final layout of the proposed power line and MTS avoids watercourses and recommended buffers as far as possible. Utilisation should be made of existing disturbed areas and access roads.
- A stormwater management plan should be compiled for the compacted surfaces within the site by the project engineer with input from the freshwater specialist. The plan should aim to reduce the intensity of runoff particularly on the steeper slopes and reduce the intensity of the discharge into the adjacent drainage lines. Where necessary measures to dissipate flow intensity or protect erosion should be included in the plan. Adjacent to wetland areas, the plan should encourage infiltration rather than runoff and should prevent the impedance of surface or sub-surface flows. The plan should also mitigate any contaminated runoff from the construction and operation activities from being discharged into any of the aquatic features within the site.
- Adequate and erosion mitigation measures should be incorporated into designs.
- For any new infrastructure placed within the watercourses:
 - The structure should not impede or concentrate the flow in the watercourse;
 - The structure should also be placed at the base level of the channel and be orientated in line with the channel;
 - Any rubble or waste associated with the construction works within the aquatic features should be removed once construction is complete; and
 - Water consumption requirements for the site for the construction must be via an authorised water supply.
- For all project related components within the site, any aquatic features of high sensitivity (wetland areas and vernal pools) within the immediate area should be demarcated by the appointed ECO prior to commencement of the construction activities and treated as no-go areas during the construction phase.
- Any activities that require construction within the delineated aquatic features and the recommended buffers should be described in method statements that are approved by the ECO.
- Rehabilitation of any the disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity as described above.

Visual Impact Assessment:

A Visual Impact Assessment specialist study was conducted as part of the 2017 - 2018 BA Process and an addendum to this Visual Impact Assessment was conducted to assess the additional infrastructure. It is included in Appendix D.3 of this BA Report. The 2017 - 2018 study notes that the landscape surrounding the proposed site has a rural agricultural character with a strong sense of remoteness, and potential for scenic views (Holland, 2017).

The following main impacts were identified in the **2017 Visual Impact Assessment (Holland, 2017):**

Construction Phase:

- Potential visual intrusion of construction activities on existing views of sensitive visual receptors in the surrounding landscape.

Operational Phase:

- Potential landscape impact of the proposed electrical infrastructure on a rural agricultural landscape with a strong sense of remoteness and potential for scenic views; and
- Potential visual intrusion of the proposed electrical infrastructure on the views of sensitive visual receptors.

Decommissioning Phase:

- Potential visual intrusion of decommissioning activities on existing views of sensitive visual receptors.

Cumulative Impacts:

- Cumulative impact of renewable energy generation projects and electrical infrastructure on the existing rural-agricultural landscape; and
- Cumulative visual impact of renewable energy generation projects and electrical infrastructure on existing views of sensitive visual receptors in the surrounding landscape.

The following main impacts were identified in the **2019 Visual Impact Assessment Addendum:**

Construction and Decommissioning Phases:

- Altered sense of place and visual intrusion during the proposed construction and decommissioning of the MTS as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust); and
- Altered sense of place and visual intrusion during the proposed construction and decommissioning of the 400 kV power line as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust).

Operational Phase:

- Altered sense of place and visual intrusion from the proposed MTS; and
- Altered sense of place and visual intrusion from the proposed 400 kV line.

The 2019 Visual Impact Assessment Addendum noted that the introduction of a new substation and a 4 km 400kV power line route is highly unlikely to further increase the cumulative impact of the proposed EGI on the visual character and sense of place of the study area.

Overall, the above impacts identified as part of the Visual Impact Assessment Addendum (Appendix D.3 of this BA Report) are predicted to be of a low to very low significance with the implementation of mitigation measures. No impacts were assessed as being of high significance after the implementation of mitigation.

The following main mitigation measures were identified in the Visual Impact Assessment specialist study:

- Be sensitive towards the use of glass or material with a high reflectivity which may cause glare and increase visual impacts.
- Locate pylons away from farmstead buildings and beyond the direct line of sight from these buildings as far as possible.
- Install lattice structures (as the preferred pylon structure) as far as possible.
- Limit and phase vegetation clearance and the footprint of construction and decommissioning activities to what is absolutely essential.
- Utilise existing access roads as far as possible. If new roads are required, then avoid clearing natural vegetation to facilitate access to the final pylon positions. If access across natural vegetation is required, then prune/remove large shrubs rather than clearing vegetation completely.

- Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.
- Keep construction and decommissioning sites tidy and all activities, material and machinery contained within an area that is as small as possible.
- Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction and Decommissioning Phases.
- Rehabilitate areas affected by scarring and put measures in place to prevent erosion.

Heritage Impact Assessment (Palaeontology, Archaeology and Cultural Landscape):

A Heritage Impact Assessment (HIA) was undertaken as part of the BA Process and is included in Appendix D.4 of this BA Report. The HIA includes a description of the palaeontology, archaeology and cultural landscape. The HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the heritage resources. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the DEA who will review the finalised BA Report and grant or withhold authorisation.

Archaeology and Cultural Landscape:

The HIA explained that archaeological remains are generally scarce but are found throughout the area. Stone Age material was rare with a precolonial kraal complex (Northern Cape) and a geometric rock art site (Western Cape) being the most significant sites recorded. Isolated stone artefacts were remarkably rare, especially above the escarpment, but a few small scatters were recorded on the plains below the escarpment (Western Cape). The vast majority of archaeological remains found were historical and ranged from a ruined farm complex to small, isolated ruined structures and isolated individual artefacts. Several sites lie close to the alignment but the eastern part of it was devised by the present author to avoid these sites.

Some graveyards and buildings are present in the wider area but all are located well away from the proposed power line alignments and no impacts are expected. The rural cultural landscape extends throughout the study area but, aside from fences and farm tracks, human interventions are generally very sparse. The site lies within the Komsberg REDZ and Central Power Corridor (that was gazetted in February 2018), which promotes Renewable Energy and Electricity Grid Infrastructure development within these strategic geographical areas. and it is thus noted that a new electrical layer is due to be added to this landscape in the very near future. The escarpment, however, remains an aesthetically significant landscape for its remoteness, long views, rugged scenery and distinctive sense of place.

The following main impacts were identified in the HIA:

Construction, Operational and Decommissioning Phases (including Cumulative Impacts for the Construction Phase):

- Destruction of archaeological remains;
- Destruction of palaeontological material; and
- Alteration of the cultural and natural landscape.

Overall, the above potential impacts identified in the HIA (Appendix D.3 of this BA Report) are rated as being of moderate to very low significance (without the implementation of mitigation measures) and low to very low significance (with the implementation of mitigation measures). No impacts were assessed as being of high significance after the implementation of mitigation.

Palaeontology:

The Palaeontology Impact Assessment (which is included as an appendix of the HIA) notes that the study area of the proposed electrical infrastructure is entirely underlain by continental sediments of the Abrahamskraal Formation (Lower Beaufort Group) of Middle Permian age. Fossil material recorded from the Abrahamskraal Formation during a six-day field-based survey in 2017 of the broader study region between Sutherland and Merweville includes sparsely-scattered, and often highly weathered, bones of unidentified robust-bodied tetrapods (probably pareiasaurs and/or dinocephalians) with only one well-articulated post-cranial skeleton (that will not be impacted on by the proposed project). An extensive surface scatter of petrified wood blocks, some of which are well-preserved, was located in the western Koup, approximately 500 m from the proposed power line route on Farm Hamel Kraal 16. With the exception of the articulated skeleton and petrified wood scatter, most of these fossil occurrences are of limited palaeontological value and lie well away from the electrical infrastructure footprint and do not warrant mitigation.

The following main impacts were identified in the Palaeontological Impact Assessment:

Construction Phase:

- Disturbance, damage or destruction of scientifically important fossils at or beneath the ground surface as a result of surface clearance and excavations for the proposed electrical infrastructure.

The assessment notes that with the implementation of mitigation measures, the significance of the abovementioned potential impact is assessed as very low (negative) in terms of palaeontological heritage resources.

The following main mitigation measures were identified in the HIA for Palaeontology, Archaeology and Cultural Landscape:

- Significant palaeontological and archaeological sites should be identified on project maps, safeguarded and regarded as no-go zones with buffers of at least 30 m (the exception is the service road diversion which comes within 20 m of the rock art site but uses an existing farm track);
- Ensure that all areas not already surveyed as part of this assessment are examined by both an archaeologist and a palaeontologist in order to identify any areas or sites that should be protected or mitigated prior to commencement of development. Note that this requirement pertains to unsurveyed parts of the assessed routes as well as to any alterations to the routing made after completion of the HIA. The resulting report, together with any recommendations for mitigation or monitoring, will need to be approved by the relevant heritage management authority (South African Heritage Resources Agency (SAHRA) for the Northern Cape and Heritage Western Cape (HWC) for the Western Cape);
- The ECO should be aware of the potential occurrence of scientifically-important fossil remains within the development footprint. All surface clearance and substantial excavations (>1 m deep) should be monitored by the ECO on an on-going basis during the construction phase; and
- If any archaeological material, palaeontological material or human burials (i.e. chance finds) are uncovered during the course of development then work in the immediate area should be halted and they should be safeguarded and protected *in situ* and immediately reported to a palaeontologist or archaeologist, as well as the heritage authorities (i.e. SAHRA or HWC) in order to plan a way forward. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Avifauna Impact Assessment:

An Avifauna Impact Assessment specialist study (Appendix D.5 of this BA Report) was undertaken as part of the BA Process to investigate the potential impact of the proposed project on avifauna and to assess whether the project is fatally flawed from an avifaunal impact perspective, and to recommend mitigation measures to reduce the significance of potential impacts. The assessment was based on the findings of a 12-months pre-construction monitoring programme that was separately conducted over four seasons in 2015/2016 for the proposed Sutherland, Sutherland 2 and Rietrug WEFs; as well as a field visit in 2019.

The following main direct and cumulative impacts were identified in the Avifauna Impact Assessment specialist study for all phases of the proposed development:

- **Construction Phase:**
 - Displacement of priority avifauna due to disturbance associated with the construction of the proposed power lines, service road and transmission substation.
 - Displacement of priority avifauna due to habitat transformation associated with the construction of the transmission substation.
- **Operational Phase:**
 - Mortality of priority avifauna due to collisions with the earth wire of the proposed 132 kV and 400 kV power lines.
 - Electrocution of priority avifauna in the transmission substation yard.
- **Decommissioning Phase:**
 - Displacement of priority avifauna due to disturbance associated with the decommissioning of the proposed power line, service road and transmission substation.

Overall, the above impacts identified as part of the Avifauna Impact Assessment (Appendix D.5 of this BA Report) are predicted to be of a very low to moderate significance with the implementation of mitigation measures. No impacts were assessed as being of high significance after the implementation of mitigation.

The following main mitigation measures were identified in the Avifauna Impact Assessment specialist study:

- Ensure that the project footprint is restricted to the absolute minimum;
- Implement maximum use of existing roads and do not permit off-road driving;
- Implement measures to control dust and noise;
- Ensure that access to the rest of the property is restricted and that all disturbed areas are rehabilitated;
- Ensure that the ECO is trained to identify Red Data avifauna nests during construction;
- The operational monitoring programme must include regular monitoring of the grid connection power line for collision mortalities.
- Prior to construction, an avifaunal specialist should conduct a site walk through, covering the final road and power line routes and pylon positions, to identify any nests/breeding/roosting activity of priority species, as well as any additional sensitive habitats. The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around avian breeding and/or movement schedules, and lowering levels of associated noise. This will also determine if, and where, Bird Flight Diverters (BFDs) are required.
- Install BFDs as per the instructions of the specialist following the site walk through, which may include the need for modified BFDs fitted with solar powered LED lights on certain spans.
- The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific mitigation be applied reactively. If any electrocutions of Red Data avifauna are reported in the proposed transmission substation yard, the avifaunal specialist must be notified for an inspection of the problem and advise on how the problem can be resolved, if at all, through appropriate mitigation.

Agricultural Impact Assessment:

An Agricultural Impact Assessment was undertaken and is included in Appendix D.6 of this BA Report. The study aimed to identify and assess all potential impacts of the proposed development on agricultural resources including soils and agricultural production potential, and to provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines for all identified potential impacts.

The following potential impacts associated with the proposed development have been identified in relation to soils and agriculture:

- **Construction Phase:**
 - Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during construction activities.
- **Decommissioning Phase:**
 - Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during decommissioning activities.

The following cumulative impact was also identified:

- Loss of agricultural land as a result of occupation of and disturbance to agricultural land as a result of multiple projects.

Overall, the above impacts identified as part of the Agricultural Impact Assessment (Appendix D.6 of this BA Report) are predicted to be of a very low significance with the implementation of mitigation measures. No impacts were assessed as being of high significance before and after the implementation of mitigation.

The following main mitigation measure was identified in the Agricultural Impact Assessment specialist study:

- Implement an effective system of storm water run-off control, where it is required. It would only be required where land disturbance could potentially lead to run-off accumulation that might then lead to down slope erosion. The system should control water movement by means of bunds and ditches, so that it safely disperses and disseminates any run-off accumulation into the veld.

According to the specialist, there are no restrictions relating to agriculture which preclude authorisation of the proposed development and therefore, from an agricultural impact point of view, the development should be authorised. There are no conditions resulting from this assessment that need to be included in the Environmental Authorisation.

EAP's Recommendation

This BA Report has investigated and assessed the significance of the potential negative direct, indirect and cumulative impacts associated with the proposed Electrical Grid Infrastructure project. No negative impacts have been identified within this BA that, in the opinion of the EAPs who have conducted this BA Process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Based on the findings of the specialist studies, the proposed project is considered to have an overall very low to moderate negative environmental impact (with the implementation of mitigation measures). All of the specialists have recommended that the proposed project receives EA and that the recommended mitigation measures are implemented.

This BA considered the nature, scale and location of the proposed development as well as the wise use of land (i.e. is this the right time and place for the development of this proposed project). The proposed project is required as part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bidding process to confirm that the proposed Sutherland, Sutherland 2 and Rietrug WEFs are enabled and equipped with the necessary infrastructure to connect to the national grid. Overall the proposed Electrical Grid Infrastructure project will fundamentally support and enable the functioning of the proposed WEFs and to ensure that it is allowed to contribute to the renewable energy targets proposed by the Department of Minerals and Energy. In addition, on a municipal planning level, the proposed project does not go against any of the objectives set within the IDP of the local municipality. The proposed projects falls within the gazetted Central Power Corridor and within REDZ 2: Komsberg and is therefore aligned with national planning initiatives to support sustainable development.

Taking into consideration the findings of the BA Process, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Sutherland region. The proposed project will play a key role in enabling and facilitating the construction of the proposed Sutherland, Sutherland 2 and Rietrug WEFs, which will add electricity to the national grid. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed project receive EA in terms of the EIA Regulations promulgated under the NEMA.

Section 24 of the Constitutional Act states that “everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans. In order to ensure the effective implementation of the mitigation and management actions, a Project Specific EMP has been compiled and is included in Appendix F of the BA Report. The mitigation measures necessary to ensure that the project is planned and carried out in an environmentally responsible manner are listed in the EMP.

glossary

AC	Alternating Current
BA	Basic Assessment
BGIS	Biodiversity Geographic Information System
BID	Background Information Document
CA	Competent Authority
CBA	Critical Biodiversity Area
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEFF	Department of Environment, Forestry and Fisheries
DHSWS	Department of Human Settlements, Water and Sanitation
DOE	Department of Energy
DME	Department of Minerals and Energy
DC	Direct Current
DMR	Department of Minerals Resources
DOE	Department Of Energy
DOT	Department of Transport
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPSA	Environmental Assessment Practitioner Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIP	Environmental Implementation Plan
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
ERM	Environmental Resources Management (PTY) Ltd
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Protection Areas
GG	Government Gazette
GIS	Geographical Information Systems
GN	Government Notice
GN R	Government Notice Regulation
HWC	Heritage Western Cape
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
IDP	Integrated Development Plan
IPP	Independent Power Producer
IRP	Integrated Resource Plan
MW	Megawatts
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)
NFEPA	National Freshwater Ecosystems Protected Areas
NHRA	National Heritage Resources Act (Act 25 of 1999)

NPAES	National Protected Expansion Strategy
NWA	National Water Act (Act 36 of 1998)
O&M	Operation and Maintenance
PIA	Palaeontology Impact Assessment
PES	Present Ecological State
PPA	Power Purchasing Agreement
PPP	Public Participation Process
PSDF	Provincial Spatial Development Framework
PSSA	Palaeontological Society of South Africa
PV	Photovoltaic
REDZs	Renewable Energy Development Zones
REC	Recommended Ecological Category
REF	Renewable Energy Facility
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SIP	Strategic Infrastructure Project
SKA	Square Kilometre Array
TOR	Terms of Reference
WEF	Wind Energy Facility
WCBSP	Western Cape Biodiversity Spatial Plan
WUL	Water Use License
WULA	Water Use License Application

Summary of where requirements of Appendix 1 of the 2014 NEMA EIA Regulations (as amended, GN R326) are provided in this BA Report

Appendix 1	YES / NO	SECTION IN BA REPORT
<p>Objective of the basic assessment process</p> <p>2) The objective of the basic assessment process is to, through a consultative process-</p> <ul style="list-style-type: none"> a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context; b) identify the alternatives considered, including the activity, location, and technology alternatives; c) describe the need and desirability of the proposed alternatives; d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine- <ul style="list-style-type: none"> (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and (ii) the degree to which these impacts- <ul style="list-style-type: none"> (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; and e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to- <ul style="list-style-type: none"> (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored. 	<p>Yes</p>	<p>Legislation and Policy - Section A (7) and Section A (10)</p> <p>Alternatives - Section A (8)</p> <p>Need and Desirability - Section A (1), Section A (8) and Section A (9)</p>
<p>Scope of assessment and content of basic assessment reports</p> <p>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:</p> <ul style="list-style-type: none"> (a) details of: <ul style="list-style-type: none"> (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae; 	<p>Yes</p>	<p>Section A (1), Section A (2) and Appendix G</p>
<ul style="list-style-type: none"> (b) the location of the activity, including: <ul style="list-style-type: none"> (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; 	<p>Yes</p>	<p>Sections A (1), Section A (8), Section B (1), and Appendix A</p>

Appendix 1	YES / NO	SECTION IN BA REPORT
(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; 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;	Yes	Section A and Appendix A
(d) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure;	Yes	Section A
(e) a description of the policy and legislative context within which the development is proposed including- (i) 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 (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Yes	Section A (7), Section A (9), Section A (10) and Appendix D
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;	Yes	Section A (1), Section A (8) and Section A (9)
g) a motivation for the preferred site, activity and technology alternative;	Yes	Section A (8)
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered;	Yes	Refer to Section A (8) of the BA Report for a description of the alternatives considered, and a justification for the inapplicability of certain alternatives.
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Yes	Refer to Section C of the BA Report for a description of the Public Participation Process undertaken. Supporting Public Participation Documents are included in Appendix E of this BA Report.
(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;	Yes	Any issues raised during the Public Participation Process will be included in Section C and Appendix E of the Final BA Report.
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Yes	Refer to Section A (8) of the BA Report for a description of the alternatives considered. Site alternatives are not applicable as it is dependent on the location of the proposed Sutherland, Sutherland 2 and Rietrug WEFs and the Major Transmission Substation. The specialist studies included in

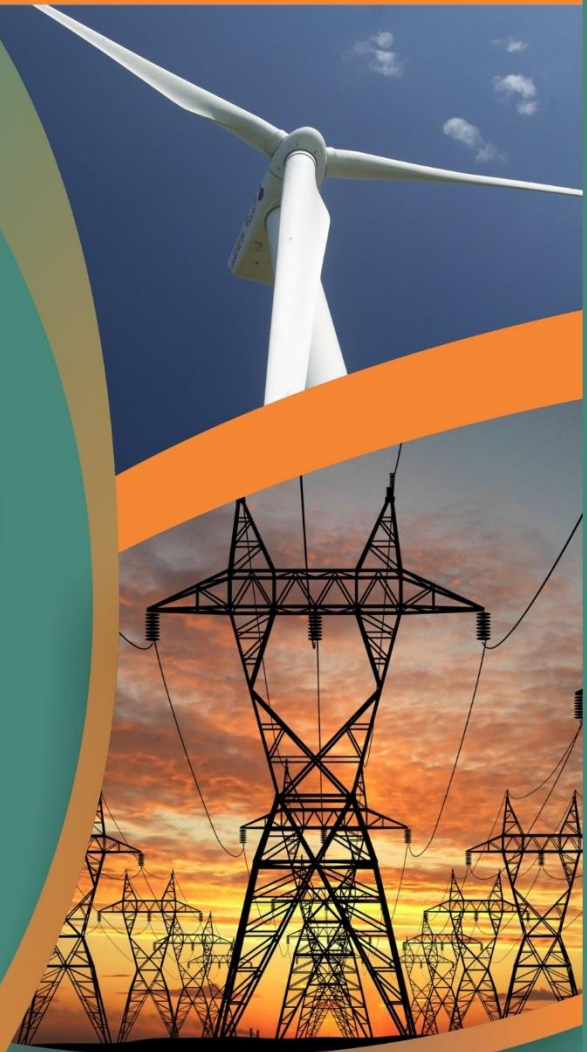
Appendix 1	YES / NO	SECTION IN BA REPORT
		Appendix D of this BA Report also include a description of the environment relating to the affected environment.
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the 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;	Yes	Refer to Section A (8) of the BA Report for a description of the alternatives considered, and a justification for the inapplicability of certain alternatives. Note that a complete impact assessment is included in Section D of this BA Report, with specialist studies included in Appendix D, which also includes relevant mitigation measures. The impact assessment methodology is also included in Section D of this BA Report.
(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;	Yes	
(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;	Yes	
(viii) the possible mitigation measures that could be applied and level of residual risk;	Yes	
(ix) the outcome of the site selection matrix;	Yes	
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Yes	Section A (8)
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	Yes	
(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;	Yes	Section D and Appendix D
(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;	Yes	Section D and Appendix D
(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;	Yes	Section D and Section E

Appendix 1	YES / NO	SECTION IN BA REPORT
(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 that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Yes	Section D and Section E, and Appendix A, Appendix D and Appendix F
(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;	Yes	Section D and Section E, and Appendix D and Appendix F
(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;	Yes	Section D and Section E, and Appendix D and Appendix F
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Yes	Appendix D
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Yes	Section E of this BA Report and the Relevant Sections of the Specialist Studies in Appendix D of this BA Report
(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;	X	Not Applicable
(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	Yes	Appendix G
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	X	Not Applicable
(t) any specific information that may be required by the competent authority; and	X	Not Applicable
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	X	Not Applicable
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.	X	Not Applicable

BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces

BASIC ASSESSMENT REPORT



contents

SECTION A: INTRODUCTION, PROJECT DESCRIPTION AND LEGISLATIVE REVIEW	25
SECTION B: DESCRIPTION OF THE AFFECTED ENVIRONMENT	83
SECTION C: PUBLIC PARTICIPATION	105
SECTION D: IMPACT ASSESSMENT	110
SECTION E: RECOMMENDATION OF PRACTITIONER	164
SECTION F: APPENDICES	169

SECTION A: INTRODUCTION, PROJECT DESCRIPTION AND LEGISLATIVE REVIEW

1. INTRODUCTION

1.1. Proposed Project

South Africa Mainstream Renewable Power Developments (PTY) Ltd (herein-after referred to as Mainstream) is proposing the development of a 132 kV power line, a 400 kV power line and a 400 kV Major Transmission Substation (MTS) near Sutherland in the Northern and Western Cape. The proposed power line is to distribute electricity generated by the proposed and authorised Rietrug Wind Energy Facility (WEF), the Sutherland WEF and the Sutherland 2 WEF (herein-after referred to as WEFs) to the national grid. These WEFs received EAs dated 10 November 2016 (Department of Environmental Affairs (DEA) Reference Numbers: 12/12/20/1782/1; 12/12/20/1782/2; and 12/12/20/1782/3, respectively), from the DEA. Two subsequent applications for substantive amendment have been approved by DEA (now operating as the Department of Environment, Forestry and Fisheries (DEFF)). A third application for substantive amendment is currently being undertaken by the CSIR to change turbine specifications (i.e. amend the turbine hub height and rotor diameter), and the contact details of the holder of the Environmental Authorisations. This Amendment Process is being undertaken separately.

The proposed 132 kV power line occurs in the Northern Cape Province, approximately 23 km south of Sutherland and 50 km north of Laingsburg, under the jurisdiction of the Namakwa District Municipality and the Karoo Hoogland Local Municipality. The power line routing also extends into the Western Cape Province, under the jurisdiction of the Central Karoo District Municipality and the Laingsburg Local Municipality.

The farms and farm portions which will be affected by the proposed electrical grid infrastructure are listed below and illustrated in Figure 1:

- Remaining Extent of Beeren Valley Farm 150;
- Remaining Extent of Nooitgedacht Farm 148;
- Remaining Extent of Hartebeeste Fontein Farm 147;
- Portion 1 of Farm 219;
- Remaining Extent of Farm 219;
- Remaining Extent of Farm 280;
- Portion 1 of Rheebokkenfontein Farm 4;
- Portion 2 of Rheebokkenfontein Farm 4;
- Portion 2 of Farm De Molen 5;
- Portion 6 of Farm Hamelkraal 16;
- Portion 7 of Farm Hamelkraal 16; and
- Remaining Extent of Spitskop Farm 20

The proposed Electrical Grid Infrastructure also includes service roads, a laydown area and Operational and Maintenance (O&M) building. The project components are indicated in Figure 2A and 2B.

It should be noted that this BA covers the proposed 132 kV power line routing from the authorised Sutherland on-site substation to the proposed 400 kV MTS and the subsequent routing to the existing 400 kV Eskom power line via a proposed 4 km long 400 kV power line. The proposed 132 kV power line routing from the Sutherland 2 on-site substation to the Sutherland on site substation has been assessed and approved as part of a separate BA that was undertaken in 2017. This project received Environmental Authorisation in February 2018.

The 132 kV line routing proposed as part of this application has been previously assessed as part of the proposed construction of the Electrical Grid Infrastructure for the Sutherland 2 Wind Energy Facility (WEF) (14/12/16/3/3/1/1814/AM1), Rietrug WEF (14/12/16/3/3/1/1815) and Sutherland WEF (14/12/16/3/3/1/1816). The electrical infrastructure project for the Rietrug and Sutherland 2 WEFs received EAs in February 2018. The electrical infrastructure project for the Sutherland WEFs received EA in March 2018. Currently a joint BA process is undertaken instead of separate BAs for each proposed WEF as was done for the initial BAs (CSIR, 2017).

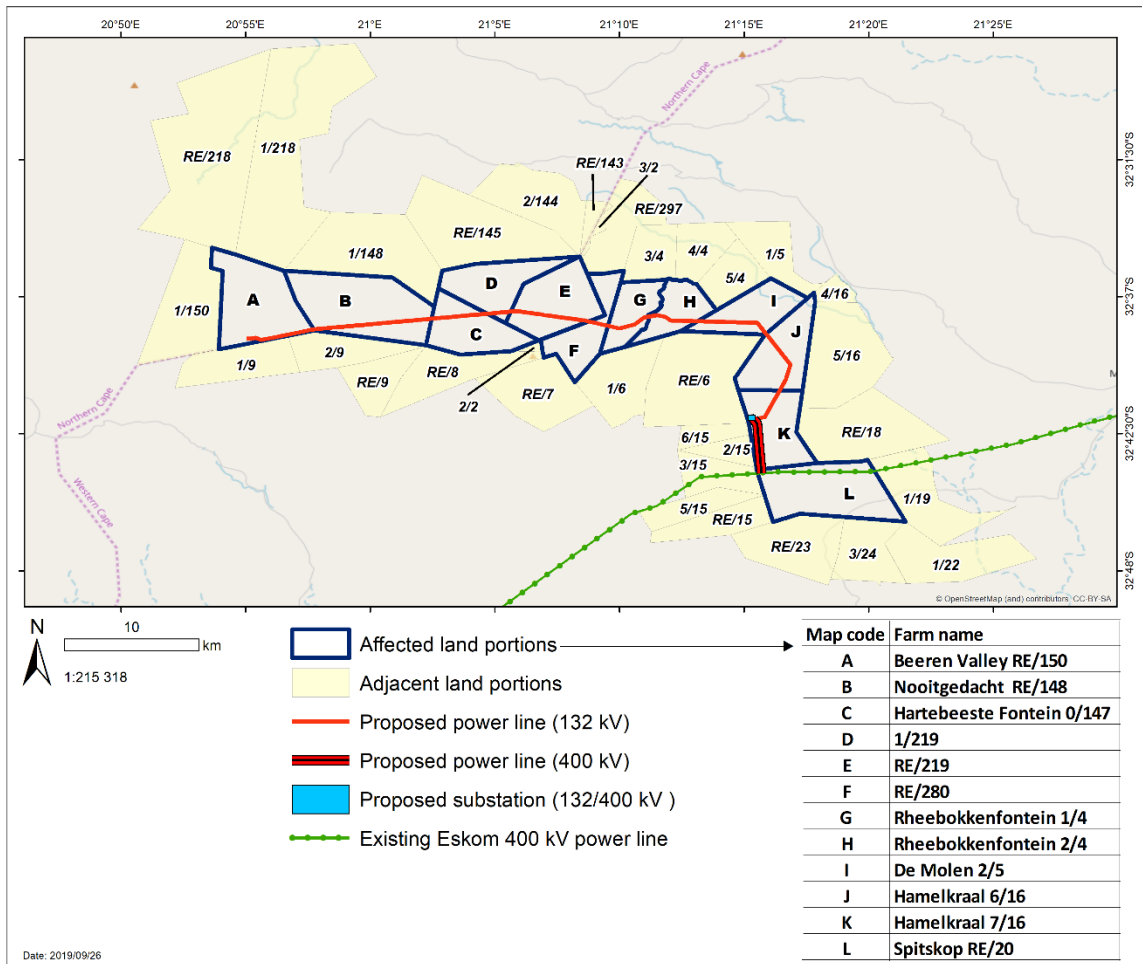


Figure 1: Proposed Locality of the Electrical Grid Infrastructure, and Affected and Adjacent Farm Portions.

1.2. National Planning Initiatives

DEA commissioned a Strategic Environmental Assessment (SEA) for Electrical Grid Infrastructure to assist Eskom with identifying priority corridors and to improve environmental regulatory processes inside the corridors in support of Strategic Infrastructure Project (SIP) 10. The final Power Corridors assessed as part of the 2016 Electricity Grid Infrastructure SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 113. The proposed Electrical Grid Infrastructure project falls within the Central Power Corridor included in the Electrical Grid Infrastructure SEA. As such a BA is required, as opposed to a full Scoping and EIA Process, which is required for all activities listed in Listing Notice 2. The decision-making timeframe has also been reduced from 107 days to 57 days (more details are provided in Section A.7 of this BA Report).

The proposed project also falls within the Renewable Energy Zone (REDZ) 2 (i.e. Komsberg REDZ). The eight REDZs that were assessed as part of the 2015 Wind and Solar Phase 1 SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 114. The REDZs were identified in five provinces, namely the Eastern Cape, Western Cape, Northern Cape, Free State and North West. The project relates to the development of Electricity Grid Infrastructure to support the proposed WEFs. Therefore, the development of Electricity Grid Infrastructure serves as the subject of this Application of Environmental Authorisation.

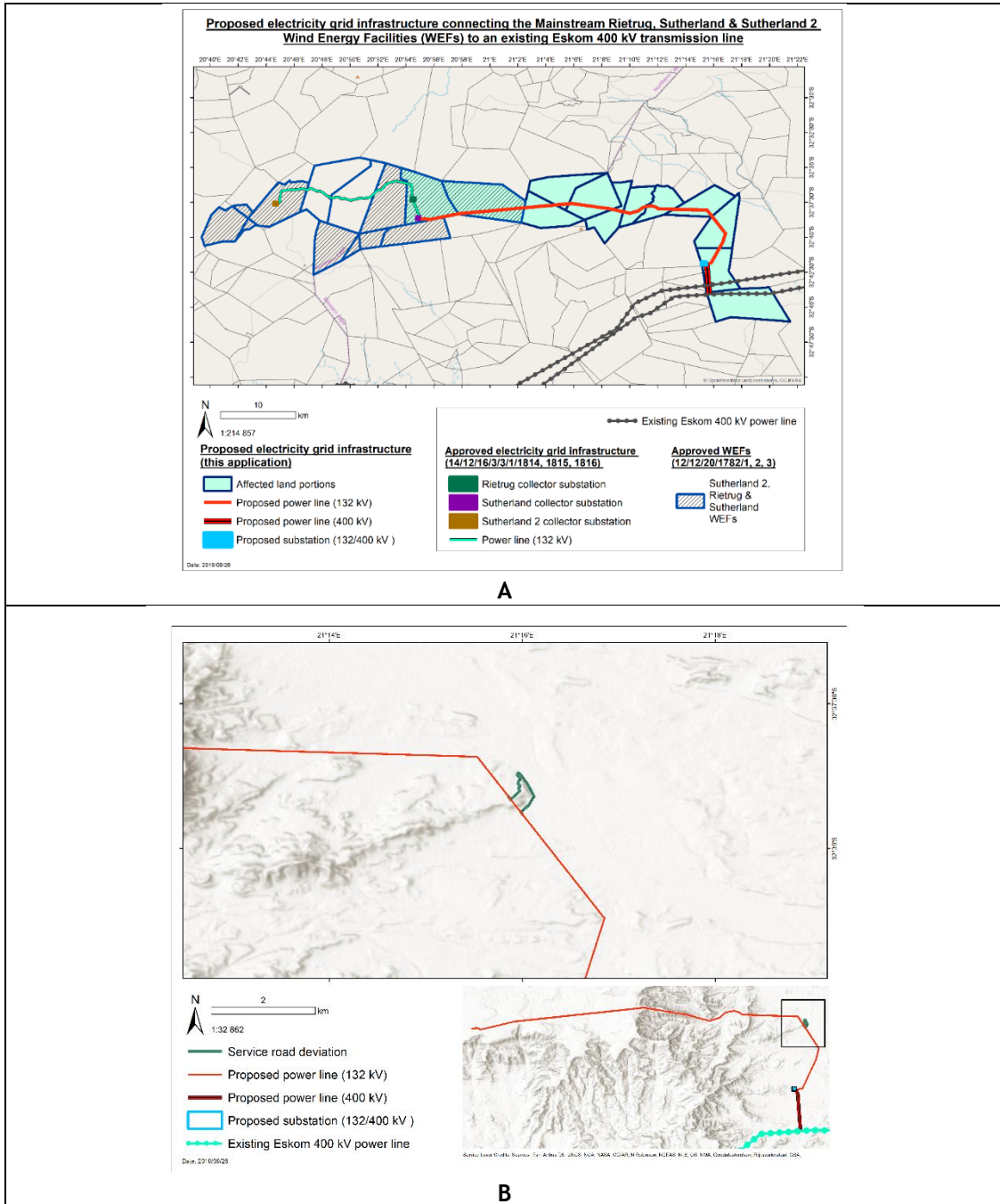


Figure 2: A) Proposed Electrical Grid Infrastructure connecting the proposed Sutherland, Sutherland 2 and Rietrug WEFs to an existing Eskom 400 kV power line. B) Proposed Service Road Deviation.

1.3. Background and Environmental Authorisation Process

1.3.1. Approved Sutherland, Sutherland 2, and Rietrug Wind Energy Facilities

As noted above, the proposed Electrical Grid Infrastructure project is in support of the proposed WEFs. Mainstream appointed an independent Environmental Assessment Practitioner (EAP) in 2010 to undertake an Environmental Impact Assessment (EIA) for the proposed construction and operation of the Sutherland Renewable Energy Facility (REF), consisting of a Solar Energy Facility and a WEF, with a collective generation capacity (i.e. for wind and solar) of 747 MW to 1137 MW. The EIA was undertaken in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the NEMA EIA Regulations promulgated on 21 April 2006, in Government Notice (GN) R385, R386, and R387.

Subsequent to the completion of the EIA Process (Environmental Resources Management (ERM), 2011), Mainstream accordingly received Environmental Authorisation on 22 February 2012 (DEA Reference Number: 12/12/20/1782), from the National DEA to construct and operate the proposed Sutherland REF. Following this, a non-substantive amendment process (to amend certain project details, the details of the applicant, and to extend the validity period of the EA) was undertaken and an amended EA, dated 6 October 2015 (DEA Reference Number: 12/12/20/1782/AM1), was issued to Mainstream.

As noted above, the original and amended EA authorised Mainstream to develop a 747 MW to 1137 MW REF, with 325 turbines on site. Based on the generation capacity of the wind turbines, this provision allocated roughly 650 MW to the WEF component of the REF. Mainstream wishes to potentially bid these projects in a tender round of the Department of Energy's (DOE) Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). However, the maximum generation capacity that can currently be bid for a WEF is 140 MW. Therefore, Mainstream appointed the Council for Scientific and Industrial Research (CSIR) to submit applications to the National DEA for further substantive amendments of the original EA and the amended EA as indicated below and illustrated in Figure 3A. Figure 3A provides a summary of the Amendment Processes that have been completed and currently underway.

▪ Amendment 1

The first amendment (i.e. Amendment 1) was undertaken to split the existing Environmental Authorisation into three separate projects so that each WEF has a generation capacity of 140 MW. The three split WEFs are referred to as the Sutherland WEF; Sutherland 2 WEF; and Rietrug WEF projects, and their approximate locality is indicated in Figure 3B below. The proposed Sutherland WEF occurs in the Northern Cape and Western Cape Provinces. On the other hand, the proposed Sutherland 2 WEF and Rietrug WEF occur entirely within the Northern Cape Province.

The CSIR accordingly submitted the Application for EA Amendment (i.e. Amendment 1) to the National DEA on 20 April 2016, as well as three separate Amendment Reports for each WEF (which were subjected to Public Participation) in July 2016 for consideration and decision-making in terms of Regulation 33 of the 2014 NEMA EIA Regulations (GN R983). On 10 November 2016, the National DEA accordingly granted separate EAs for the Rietrug, Sutherland and Sutherland 2 WEFs (DEA Reference Numbers: 12/12/20/1782/1; 12/12/20/1782/2; and 12/12/20/1782/3, respectively). These EAs replace the original EA and the amended EA (dated 6 October 2015).

▪ Amendment 2

The second substantive amendment (i.e. Amendment 2) was undertaken to apply to change the turbine hub height and rotor diameter, and associated layout, of the split and authorised WEFs. The CSIR completed and submitted three separate Applications for Amendment to the EAs (dated 10 November 2016) on 3 February 2017 for the WEFs. An Amendment Report was compiled for each Amendment 2 project and was released to the public for a 30-day comment period extending from 17 February 2017 to 22 April 2017. Thereafter, in May 2017, the Amendment Reports were

submitted to the National DEA for consideration and decision-making in terms of Regulation 33 of the 2014 NEMA EIA Regulations (as amended). The amendments received EAs in August 2017 (DEA reference numbers: EAs for the Rietrug, Sutherland and Sutherland 2 WEFs (DEA Reference Numbers: 12/12/20/1782/1/AM2; 12/12/20/1782/2/AM2; and 12/12/20/1782/3/AM2, respectively).

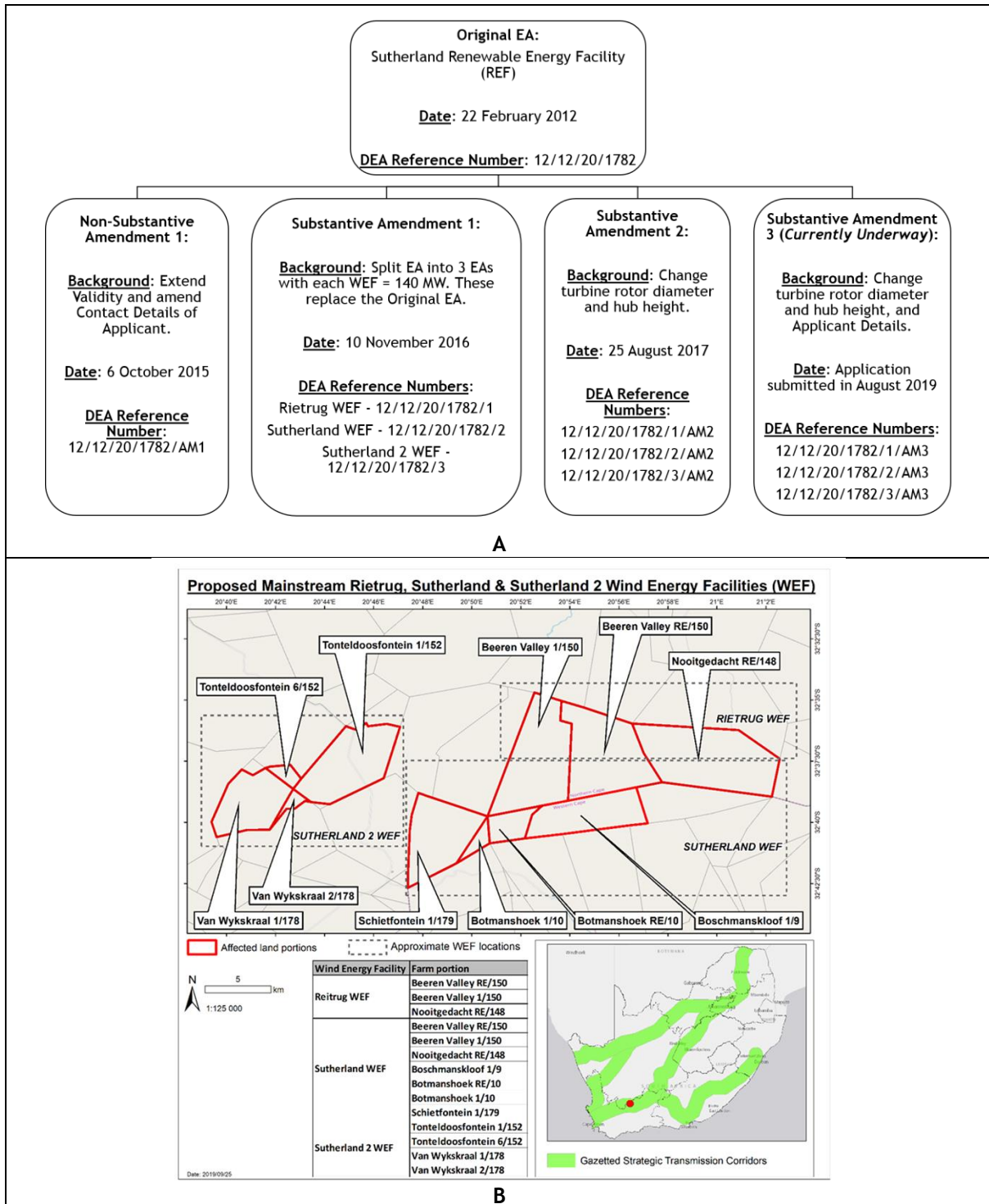


Figure 3: A) Summary of the Amendments to the EAs of the WEFs. B) Proposed Locality of the Authorised Sutherland, Sutherland 2 and Rietrug WEFs.

- **Amendment 3 (Currently Underway)**

Currently a third substantive amendment is being undertaken for the Rietrug, Sutherland and Sutherland 2 WEFs. The third amendment (i.e. Amendment 3) is undertaken to apply to change the turbine hub height and rotor diameter from the authorised 150 m to 200 m each. This amendment also includes a change to the contact details of the holder of the Environmental Authorisation. The CSIR completed and submitted three separate Applications for Amendment to the EAs in August 2019. A Draft Amendment Report has been compiled for each Amendment 3 project and has been released to the public for a 30-day comment period. Thereafter the Final Amendment Reports will be submitted to the DEFF as the Competent Authority (previously DEA) for consideration and decision-making in terms of Regulation 33 of the 2014 NEMA EIA Regulations (as amended). The amendments received the following reference numbers (EAs for the Rietrug, Sutherland and Sutherland 2 WEFs (DEFF Reference Numbers: 12/12/20/1782/1/AM3; 12/12/20/1782/2/AM3; and 12/12/20/1782/3/AM3, respectively).

2. PROJECT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended, GN R326), the applicant has appointed the CSIR to undertake the BA process in order to determine the biophysical, social and economic impacts associated with undertaking the proposed activity. The BA project team is led by Minnelise Levendal (EAP), who is supported by the Project Manager, Rohaida Abed. Paul Lochner serves as a Technical Advisor for the proposed project.

- **Brief biosketch of Paul Lochner (Project Quality Assurance and Reviewer, CSIR):**

Paul Lochner is an EAP at the CSIR in Stellenbosch, with over 25 years of experience in a wide range of environmental assessment and management studies. His particular experience is in the renewable energy, oil and gas, wetland management, and industrial and port development sectors. He has been closely involvement in the research and application of SEA in South Africa, and also has a wide range of experience in EIA and Environmental Management Plans (EMPs).

Paul commenced work at CSIR in 1992, after completing a degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. Since 2003, he has been a certified EAP for South Africa. For the past ten years, he has been the manager of the Environmental Management Services (EMS) group within CSIR, which comprises approximately 20 environmental scientists.

He has been closely involved in environmental studies for industrial and port-related projects, such as in the Coega Industrial Development Zone (IDZ) and harbour near Port Elizabeth, the port of Saldanha and the Matola port in Maputo. More recently, he has been project leader on several SEAs that are being undertaken for the DEFF in order to facilitate the responsible implementation of large-scale infrastructure developments. These SEAs have included wind and solar PV energy, electricity transmission line planning, shale gas development in the Karoo, the Square Kilometre Array (SKA) radio-telescope, gas pipeline corridors and aquaculture development. These SEAs support the implementation of the National Development Plan and Operation Phakisa.

In addition to his project experience, Paul is recognised as a leader in best practice in environmental assessment, as evidenced by his appointments to write several guidelines for government. These include guidelines on Integrated Environmental Management and SEA for national DEA, as well as guidelines for the Western Cape government and the (then-named) Department of Minerals and Energy.

- **Brief biosketch of Minnelise Levendal (Project Leader and EAP, CSIR):**

Minnelise has more than 15 years of experience in environmental assessment and management and is a senior EAP in the EMS group of the CSIR. She has a Master's degree in Botany from the University of Stellenbosch. She is a registered Professional Natural Scientist (Registration Number:

117078) with the South African Council for Natural Scientific Professions (SACNASP). Minnelise has experience in the management and integration of various types of environmental assessments in South Africa for various sectors, including renewable energy and industry. Minnelise has undertaken several Environmental Assessments for wind farms and solar PV farms (i.e. EIAs, BAs, Amendment and Appeal Processes) in the Northern Cape, Western Cape and Eastern Cape. Minnelise is currently the project leader for the Amendment processes for the adjacent Sutherland, Sutherland 2, and Rietrug WEFs, which received positive Environmental Authorisations in November 2016.

▪ **Brief biosketch of Rohaida Abed (Project Manager, CSIR):**

Rohaida Abed is an EAP in the CSIR Environmental Management Services team based in Durban. She has 9 years of experience in the Environmental Management field and has been involved in various transport infrastructure related projects as an Environmental Control Officer, which included monitoring compliance with Environmental Authorisations and Environmental Management Plans. She has also been conducting Environmental Assessments relating to Port infrastructure, Bulk Liquid Storage facilities and renewable energy in the capacity of Project Manager. She is also part of a team undertaking a SEA for the development of a phased Gas Pipeline and expansion of Electricity Grid Infrastructure in South Africa, for the National DEA, DOE, DPE, iGas, Transnet and Eskom. She is a registered Professional Natural Scientist (400247/14) with the SACNASP.

Refer to Appendix G of this BA Report for the Curriculum Vitae of the BA Team, which also includes a declaration of and affirmation by the EAP as required by the 2014 NEMA EIA Regulations, as amended.

The BA team also includes various specialists that have been appointed to undertake specialist studies to contribute to the BA process. These specialist studies are included in Appendix D of this BA Report. Appendix H of this BA report includes the declarations of interest by the specialists. The team which is involved in this BA process is listed in Table 1 below.

Table 1: The BA Team

Name	Organisation	Role/ Specialist Study
EAPs		
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Minnelise Levendal	CSIR	Project Leader (<i>Pr. Sci. Nat.</i>)
Rohaida Abed	CSIR	Project Manager (<i>Pr. Sci. Nat.</i>)
Specialists		
Simon Todd	3Foxes Biodiversity Solutions	Terrestrial Ecology Impact Assessment
Antonia Belcher and Dana Grobler	BlueScience (Pty) Ltd	Aquatic Ecology (Freshwater) Impact Assessment
Scott Masson	SRK Consulting	Visual Impact Assessment
Dr. Jayson Orton and Dr. John Almond	ASHA Consulting (Pty) Ltd and Natura Viva cc	Heritage Impact Assessment (Palaeontology, Archaeology and Cultural Landscape)
Chris van Rooyen and Albert Froneman	Chris van Rooyen Consulting	Avifauna Impact Assessment
Johann Lanz	Private Consultant	Agricultural Impact Assessment

It should be noted that the Heritage Impact Assessment specialist study (Appendix D.4 of this BA Report) is an integrated report including Palaeontology, Archaeology and Cultural Landscape. In addition, the Avifauna Impact Assessment (Appendix D.5 of this BA Report) provides a general description of the baseline avifaunal conditions, the corresponding impact of the proposed project on avifauna and recommendations for mitigation. It is important to note that the Avifauna Impact Assessment is based on separate avifaunal pre-construction monitoring that has been undertaken

for the proposed and authorised Sutherland, Sutherland 2 and Rietrug WEFs, as required by the DEFF and stipulated in the Environmental Authorisation issued on 10 November 2016, as well as the original EA (dated 22 February 2012) and the amended EA (dated 6 October 2015).

This BA report includes the construction of the proposed power line and associated electrical infrastructure to support the Sutherland, Sutherland 2 and Rietrug WEFs. An integrated BA, including an integrated Public Participation Process (PPP), is therefore hereby undertaken, compared to the three separate BAs, which were previously undertaken for the Electrical Grid Infrastructure to support each WEF. An application for Environmental Authorisation (EA) is currently being lodged with the DEFF for the Electrical Grid Infrastructure BA project (together with the submission of the Draft BA report for comment). The Draft BA report is currently being released to I&APs, Stakeholders and Organs of State for a 30-day review period. Following this review period, all comments received on the Draft BA Report will be included and addressed in the Issues and responses trail of the Final BA Report. The Final BA Report will be submitted to DEFF for decision-making.

3. PROJECT OVERVIEW

The applicant is proposing to develop three WEFs with a capacity of 140 MW each, comprising a total combined installed capacity of 420 MW (Figure 3B). As noted above, these WEFs have already received EAs from the National DEA. Three separate BAs have been undertaken for the proposed electrical infrastructure associated with each WEF. The electrical infrastructure project for the Rietrug and Sutherland 2 WEFs received EAs in February 2018. The Electrical Grid Infrastructure for the Sutherland WEF received EA in March 2018. As noted above, the electricity produced by the three WEFs will be transmitted to the national grid via a 132 kV and a 400 kV power line and associated electrical infrastructure, including the MTS. Once a Power Purchase Agreement (PPA) is awarded, the proposed WEFs will generate electricity for a minimum period of 20 years.

A detailed project description (based on the conceptual design) is provided in Section A (4) of this BA Report.

4. PROJECT DESCRIPTION

The locality map included in Appendix A.1 of this BA Report provides an overview of the proposed locality of the Electrical Grid Infrastructure project.

Table 2 below indicates the proposed project components that will be assessed as part of this BA process.

Table 2: Scope of the BA Process

Electrical Grid Infrastructure project (i.e. this project):
<ul style="list-style-type: none">▪ Major Transmission Substation (400 m x 400 m; including Operation and Maintenance (O&M) building and laydown area);▪ Fencing of the proposed on-site substation;▪ Overhead 132 kV power line, approximately 41 km long, from the proposed Sutherland WEF on-site substation to the MTS (including tower/pylon infrastructure and foundations). This line has been assessed as part of a previous BA process and was referred to in the initial BA reports as “Alternative 2”;▪ Overhead 400 kV power line, approximately 4 km, connecting to the proposed 400 kV MTS and an existing 400 kV Eskom power line; and▪ Service roads will be constructed below the power lines (jeep tracks).

A description of the key components of the proposed project is described below. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase.

4.1. Major Transmission Substation, O&M Building and Laydown Area

As noted above, a MTS will be constructed on Portion 7 of Hamelkraal Farm 16 to facilitate connection to the national grid. The proposed MTS is expected to extend approximately 400 m X 400 m (40 000 m²) and includes an O&M building and laydown area for construction purposes. It is understood that the laydown area will be rehabilitated at the end of construction. The proposed O&M building is expected to extend approximately 120 m X 120 m (14 400 m²) in area. The proposed laydown area is planned to cover an estimated area of 10 000 m² (1 ha).

All non-linear components of the proposed project (i.e. MTS, O&M building and laydown area) will cover an area less than 20 ha. The proposed MTS, laydown area and O&M building will be fenced off temporarily during the construction phase. In addition, permanent security fencing will be provided during the operational phase for the proposed MTS and O&M building.

4.2. Power Line and Tower Structures

The properties on which the grid line and associated infrastructure traverses (i.e. the proposed project) has third-party rights enshrined in the title deed. It is anticipated that the properties on which the proposed project will be constructed will be leased from the landowners. Mainstream has obtained lease agreements for certain properties and are in the process of obtaining them for the remainder of the properties.

The proposed power line is expected to have concrete foundations and steel tower structures (i.e. pylons). Monopole pylon structures will be adopted for the proposed power line. Lattice type structures will also be considered for the proposed power line; however, they will only be implemented where required due to the topography within the region or to comply with Eskom Standards. The line will consist of either self-supporting suspension structures or guyed monopoles (i.e. hybrid monopoles). The towers of the 132 kV power line will all have a maximum height of 32 m. The towers of the 400 kV power line can have a height ranging from 26 m to 48 m depending on the type of tower. Figures 4 (a); 4 (b); and 4 (c) respectively indicate a monopole, a self-supporting suspension tower and a Guyed-Vee suspension tower. The span lengths are estimated to range between 200 m and 400 m. Exact specifications will be confirmed during the detailed design phase.

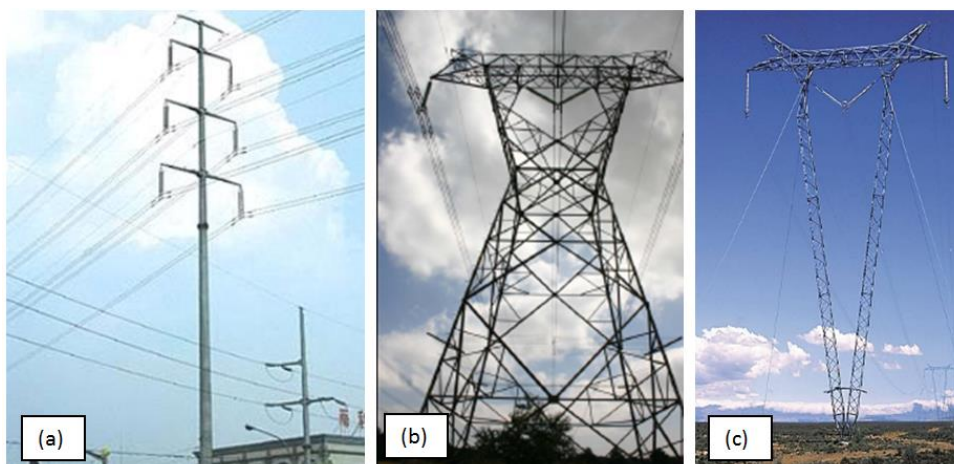


Figure 4: Different types of towers (Images: ECVV.com and Eskom)

During the construction phase, vegetation will be cleared or trimmed below the conductors and power line, on either side of the centre line, to allow for swing of the power line and stringing purposes. The clearing of vegetation will take place, with the aid of a surveyor and in accordance with the Environmental Management Programme (EMPr) included in Appendix F (and any recommendations and requirements of Eskom).

4.3. Infrastructure at the Proposed MTS

Associated electrical infrastructure will be constructed at the MTS in order to ensure that the substation is capable of receiving the additional electricity that is generated by the proposed WEFs. From the MTS the electricity will be fed into an existing 400 kV Eskom power line. Discussions have been initiated with the project applicant and Eskom to determine the requirements of connecting to the existing 400 kV Eskom power line.

4.4. Proposed Gravel Service Road and Access

The proposed project will include the construction of gravel service roads below the proposed power line. Therefore, the proposed gravel service roads will follow the same route as that of the power line and will extend approximately 45 km in length. The service road routing deviates from the proposed power line routing in one section to avoid a sensitive scarp, and it will alternatively follow the route of an unused farm road to avoid impacts of the service roads traversing the ecologically sensitive scarp. This deviation is approximately 1.7 km in length and is located on Portion 2 of Farm De Molen 5 and Portion 6 of Farm Hamelkraal 16 (as illustrated in Figure 2B). The proposed service roads will range between 4 m and 6 m wide. Exact specifications of the proposed service roads will be confirmed during the detailed design phase.

The proposed Sutherland WEF, Sutherland 2 WEF and the Rietrug WEF are located approximately 25 km east of the junction between the R354 and the District Road DR02256 (ERM, 2011). In terms of access, the proposed Sutherland WEF and electrical infrastructure sites can be accessed by a secondary road off the R354 and via secondary gravel roads and a network of farm tracks (ERM, 2011). The site can also be accessed via public road OG07 towards the east and District Road DR02256 towards the north. However, District Road DR02256 needs to be upgraded significantly (i.e. resurfaced etc.) and widened in order to allow for construction vehicles to access the proposed sites. This will be discussed separately between the local municipality and the various Independent Power Producers (IPPs) in the surrounding region who will share access of this road. This does not form part of the scope of work of this BA project.

In terms of traffic generation, the types of materials that will need to be transported to site during the construction phase include the following:

- Transformers;
- Steel and aluminium;
- Switchgear and equipment;
- Cables;
- Gravel and sand;
- Concrete;
- Water;
- Reinforcement; and
- Other material.

Trips will be generated for the transportation of staff during the construction and operational phases. During the operational phase, fewer materials will need to be transported to site.

4.5. Summary of the Approximate Details of the Proposed Infrastructure

Table 3 below provides a summary of the approximate details of the proposed Electrical Grid Infrastructure project. However, it should be re-iterated that the physical size and dimensions of the project components will be finalised upon completion of detailed engineering, which is subject to the issuing of an EA, should such an authorisation be granted (i.e. the detailed design will be undertaken after the EA has been issued). The details provided in this section are estimates and based on the worst-case, where applicable.

Table 3: Summary of Specifications of the proposed Electrical Grid Infrastructure Project

Capacity of the Proposed Power Lines	132 kV and 400 kV
Length of the Proposed Power Lines	45 km
Details of the Proposed Power Lines	Overhead power lines with concrete foundations and steel tower structures (i.e. pylons). Monopole pylon structures will be adopted for the proposed power line. The line will consist of self-supporting monopoles and guyed monopoles. The towers of the 132 kV power line will all have a maximum height of 32 m. The towers of the 400 kV power line can have a height that can range from 26 m to 48 m depending on the type of tower. Lattice type structures will only be considered and implemented where required and necessary due to the topography within the region or to comply with Eskom Standards.
Connection to the Proposed Major Transmission Substation	Associated electrical infrastructure at the proposed MTS to allow the MTS to receive the electricity generated by the WEFs.
Proposed Gravel Service Road	Width: 4 m to 6 m Length: 45 km (plus a 1.7 km deviation)
Servitude/Area within which the Proposed Service Roads will occur within	172 000 m ² to 258 000 m ²
Proposed Major Transmission Substation	400 m X 400 m (160 000 m ²)
Proposed Laydown Area	100 m X 100 m (10 000 m ²)
Proposed O&M Building	120 m X 120 m (14 400 m ²)

4.6. Water, Sewage, Waste and Electricity Requirements

- **Water Usage**

In terms of water usage, water will be used during the construction phase mainly for earthworks, domestic purposes, dust control and re-vegetation watering processes. During the construction phase, water will be sourced from the local municipality or existing boreholes (if groundwater is available and if suitable). The exact details of water requirements will be confirmed during the detailed engineering phase and will be undertaken in line with the relevant legislation. At this stage, no water is planned to be abstracted from or discharged to any surface water systems. During the operational phase of the proposed power line, water requirements are not applicable.

- **Sewage or Liquid Effluent**

The proposed project will require sewage services during the construction phase. Low volumes of sewage or liquid effluent are estimated. Liquid effluent will be limited to the ablution facilities during the construction phase. Portable sanitation facilities (i.e. chemical toilets) will be used during the construction phase, which will be regularly serviced and emptied by a suitable (private) contractor on a regular basis. The waste water will be transported to a nearby Waste Water Treatment Works for treatment. Due to the remote location of the project site; a conservancy tank or septic tank system could be used on site, which is expected to be serviced by the municipality. Due to the remote locality of the farm, sewage cannot be disposed in the municipal waterborne sewage system. Sewage disposal for the operational phase will be confirmed in line with relevant legislation.

- **Solid Waste Generation**

The quantity of solid waste generated will depend on the construction phase, which is estimated to extend 12 to 14 months. However, it is estimated that approximately 50 m³ of waste will be generated every month during the construction phase. During the construction phase, the following waste materials are expected to be generated:

- Packaging material, such as the cardboard, plastic and wooden packaging and off-cuts;
- Hazardous waste from empty tins, oils, soil containing oil and diesel (in the event of spills), and chemicals;
- Building rubble, discarded bricks, wood and concrete;
- Domestic waste generated by personnel; and
- Vegetation material generated from the clearing of vegetation.

Solid waste will be managed via the EMPr (Appendix F of the BA Report), which incorporates waste management principles. General waste will be collected and temporarily stockpiled in skips in a designated area on site and thereafter removed, emptied into trucks, and disposed at a registered waste disposal facility on a regular basis by an approved waste disposal Contractor (i.e. a suitable Contractor). Any hazardous waste (such as contaminated soil as a result of spillages) will be temporarily stockpiled (for less than 90 days) in a designated area on site (i.e. placed in leak-proof storage skips), and thereafter removed off site by a suitable service provider for safe disposal at a registered hazardous waste disposal facility. Waste disposal slips and waybills will be obtained for the collection and disposal of the general and hazardous waste. These disposal slips (i.e. safe disposal certificates) will be kept on file for auditing purposes as proof of disposal. The waste disposal facility selected will be suitable and able to receive the specified waste stream (i.e. hazardous waste will only be disposed of at a registered/licenced waste disposal facility). The details of the disposal facility will be finalised during the contracting process, prior to the commencement of construction. Where possible, recycling and re-use of material will be encouraged. Waste management is further discussed in the EMPr (Appendix F of this BA Report). During the operational phase of the proposed power line, waste generation is not applicable.

Furthermore, it is important to note that the proposed project does not trigger any activities listed in Categories A and B of the List of Waste Management Activities published in GN 921 and as such a Waste Management Licence is not required. A Waste Management Licence, in terms of the National Environmental Management: Waste Act (Act 59 of 2008) (NEM:WA), is not required when activities listed in Category C are triggered; however instead, compliance with the relevant national Norms and Standards must be achieved. Activity 2 of Category C of GN 921 states the following: “the storage of hazardous waste at a facility that has the capacity to store in excess of 80 m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste”. It is estimated that during the construction phase, limited amounts of hazardous waste will be generated. As noted above, the type of hazardous waste will be limited to waste hydraulic oils; waste engine, gear and lubricating oils; waste insulating and heat transmission oils; wastes of liquid fuels; or hazardous portions of other oil wastes. This could occur as a result of fuel spillages on site (due to construction equipment and vehicles). It is not likely that more than 80 m³ of waste fuel spillages will emanate from the construction process that will need to be stockpiled on site for longer than 90 days. Therefore, the national Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) will not need to be complied with. However, these recommendations have been included in the EMPr.

▪ Electricity Requirements

In terms of electricity supply for the construction phase, the developer will be provided with auxiliary supply from existing Eskom infrastructure. The exact location of this source as well as the route for provision of such supply are still to be determined by Eskom. During the operational phase, the power line will not have any electricity requirements as the project itself will transmit and distribute electricity.

The project applicant will consult with the municipality in order to confirm the supply of services (in terms of water, waste removal, sewage and electricity) for the proposed project. However, it must be noted that should the municipality not have adequate capacity for the handling of waste, provision of water and sewage handling provisions available; then the applicant will make use of private contractors to ensure that the services are provided. The applicant will also ensure that adequate waste disposal measures are implemented by obtaining waste disposal slips for waste removed from site (in line with the EMPr).

4.7. Overview of the Project Development Cycle

The project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has therefore been assessed by the specialist studies (Appendix D of this BA Report).

4.7.1. Construction Phase

The construction phase will take place subsequent to the issuing of an EA from the DEA and a successful bid in terms of the REIPPPP (i.e. the issuing of a PPA from the DOE). The construction phase for the proposed project is expected to extend 12 to 14 months.

As noted above, the construction phase will involve the transportation of personnel, construction material and equipment to the site, and personnel away from the site. In terms of site establishment, a laydown area will be required at the outset of the construction phase, as well as dedicated access routes from the laydown area to the working areas. Haul roads for construction traffic (for the delivery of concrete, road materials and other construction materials) will be required. As noted above, it is expected that the laydown area will be temporary in nature (for the duration of the construction phase) and will include the establishment of the construction site camp (including site offices and other temporary facilities for the appointed contractors).

During the construction phase, dust will be generated from the earthworks and excavation required for the construction of the proposed infrastructure and building foundations, the removal of vegetation, the movement of vehicles and equipment accessing the site, and the infilling of excavations and levelling. Appropriate mitigation measures will be implemented during the construction phase to reduce the dust levels. Approved soil stabilizing agents may need to be used to minimise dust. Dust generation during the construction phase will be of a short-term duration and is predicted to be of low significance with the implementation of mitigation measures. Appropriate mitigation and management measures are included in the EMPr (Appendix F of the BA Report). The construction vehicles and equipment will also generate exhaust emissions. However, these emissions are also expected to be short-term in duration and of low significance with the implementation of mitigation measures. Appropriate mitigation and management measures are included in the EMPr (Appendix F of the BA Report) with regard to traffic control.

In terms of noise generation, as part of the construction phase, noise will be generated by the construction activities, earthworks, personnel, equipment and vehicles on the site. The levels of noise are not expected to be excessive and will be in line with standard industry levels associated with the proposed activity. In addition, noise generation during the construction phase is considered to be localised and short-term, with a low to very low significance (with the implementation of mitigation measures). During the construction phase, the ambient noise is not expected to exceed 45 dB(A) during the day and 35 dB(A) at night for rural districts (as required by SANS 10103:2008). In addition, the proposed project will not generate any noise during the operational phase.

All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial and national legislation, local and international best practice, as well as the EMPr, which is included in Appendix F of this BA Report. During the construction phase, it is estimated that approximately 130 employment opportunities will be created. The employment creation is also dependent on the REIPPPP bidding requirements and the final engineering design.

The main activities that will form part of the construction phase are:

- Removal of vegetation for the proposed infrastructure;
- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Stockpiling of topsoil and cleared vegetation;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the 132 kV and 400 kV power lines and additional infrastructure.

4.7.2. Operational Phase

The following activities will occur during the operational phase:

- The transmission of electricity generated from the proposed WEFs to the MTS; and
- Maintenance of the power line servitude including the gravel service roads.

During the life span of the power line (approximately 20 years), on-going maintenance will be required on a scheduled basis. This maintenance work will be undertaken by contractors employed by the project applicant or Eskom, and in compliance with the EMPr.

4.7.3. Decommissioning Phase

The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the actual WEFs become outdated or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMPr and the site will be rehabilitated and returned to its pre-construction state.

5. ENVIRONMENTAL SENSITIVITIES

As noted above, as part of the BA process, the large development envelope was considered and assessed by the specialists for the proposed MTS, laydown area, and O&M building. The relevant and significant environmental features and no-go areas that were identified in the specialist studies have been mapped and included in Appendix A.3 of this BA Report. Based on this and the findings of the specialist studies, an environmental sensitivity map has also been produced, and included in Appendix A.4 of this BA Report, as well as the EMPr (Appendix F of this BA Report). The following environmental features and sensitive areas were identified by the specialists for consideration in the layout and location.

5.1. Terrestrial Ecology Environmental Features and Sensitivities

The Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report) notes that the majority of the route traverses open plains on the escarpment or on the lower elevation plains of the Gamka Karoo below. The plains are generally considered to represent low sensitivity areas with a relatively low abundance of species of conservation concern (SCC).

The assessment determined the following in terms of sensitivity:

- The plains are generally considered to represent low sensitivity areas with a relatively low abundance of species of conservation concern;
- The main areas of sensitivity along the power line route would be the numerous drainage lines that the power line must traverse as well as several areas of steep slopes that the line must negotiate. However, given that the span between pylons can usually be extended quite far in rugged terrain, the overall footprint within these more sensitive areas can be reduced to a low level; and
- There are some short sections of the power line route within the Western Cape that are Critical Biodiversity Area (CBA 1) associated with water courses. Within the Northern Cape, a large part of the route is either CBA 1 or CBA 2. Development within CBAs can have negative impacts on

biodiversity pattern and process and is generally considered undesirable. The footprint within the CBAs would however be low and the ecological functioning of the CBAs would not be compromised by the development. Overall the impact of the development on CBAs and broad-scale ecological processes would be low and no major impacts on ecological processes would occur.

Provided that measures to reduce secondary impact such as erosion are implemented, then risk through these areas can be reduced to an acceptable level. The impact of the power line on fauna would largely be restricted to the construction phase and associated with disturbance during construction. During the operational phase, impacts on fauna would be very low. The site for the MTS is not particularly flat and would require a large amount of earth-moving to level the site. As such, it is not considered to represent an ideal site for the MTS, but as the area is considered largely of moderate sensitivity and no particularly high value species or ecosystems are present within the footprint, it is considered acceptable and of moderate local impact.

Figure 5 below shows the proposed Electrical Grid Infrastructure and the areas of ecological value or sensitivity.

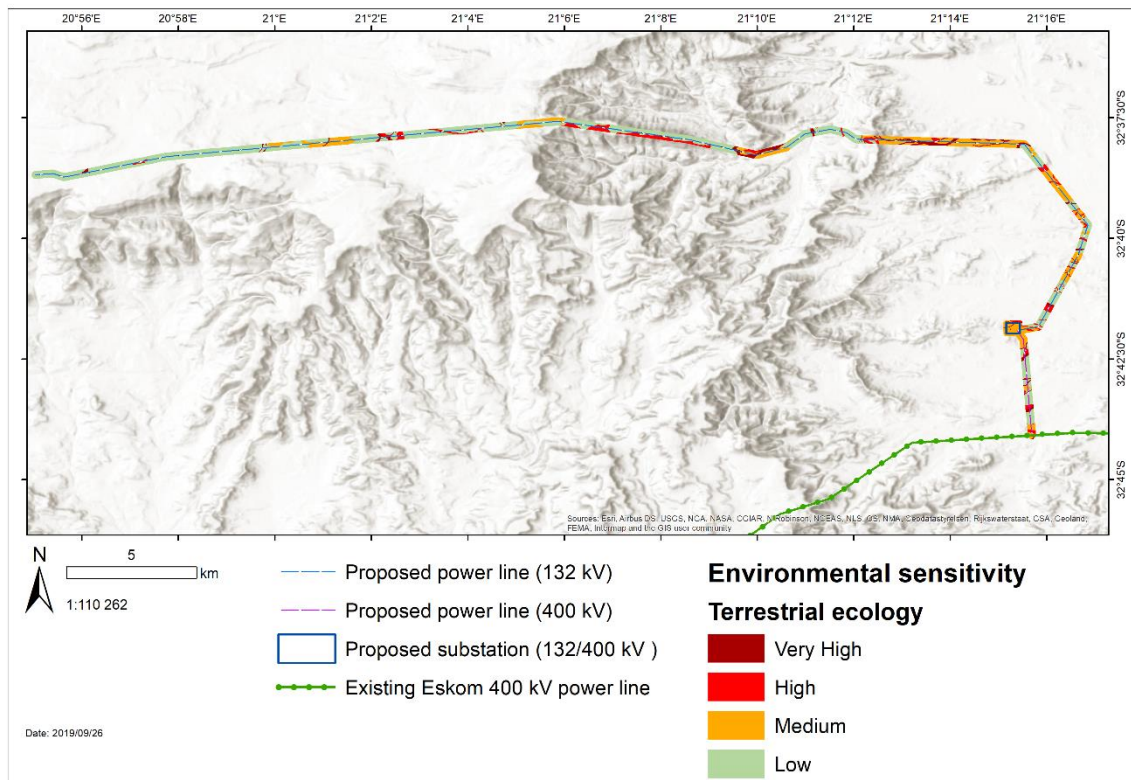


Figure 5: Ecological Sensitivity Map for the proposed Electrical Grid Infrastructure Project.

The proposed power line routing effectively avoids traversing steeper ridges and scarps. As noted above, the proposed service roads will follow the same route of the power line; however, a small portion of the service road follows the route of an existing unused farm track to avoid impacts on the steeper ridges and scarps. From a terrestrial ecological point of view, the proposed power line routing and connection to the MTS are considered to be suitable and there are no fatal flaws associated with it.

5.2. Aquatic Ecology (Freshwater) Environmental Features and Sensitivities

The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of this BA Report) notes that the western portion of the proposed project is located largely along the border between the Northern and Western Cape provinces on the higher-lying Komsberg Mountains that is the watershed between the northerly flowing Riet River tributary of the Orange River and the southerly flowing Dwars River tributaries of the Gouritz River. The eastern portion of the project is located within the upper reaches of the Vanwyks, Juk and Ouberg Tributaries of the Dwyka River, a tributary of the Gouritz River. This section of the transmission lines and the proposed substation are located within lower lying valleys and floodplain areas. Associated with the very upper reaches of the rivers on the hill tops are seep areas and vernal ponds while valley bottom and floodplain wetlands occur in the lower foothills and floodplain zones within the deeper valleys.

As noted above, the aquatic features within the study area consist of the upper reaches of the Riet River (Portugals Tributary, Salmonsloop Tributary and the Riet River) that flows northwards towards the Orange River; the upper reaches of the Buffels River (Beerfontein se Laagte Tributary) that flows southwards towards the Gouritz River; and the upper reaches of Dwyka River (Vanwyks and Juk Rivers) and the lesser, unnamed tributaries.

The study area is located largely within Upstream Freshwater Ecosystem Priority Areas (FEPA) Rivers that should not be impacted on such that they would result in degradation of more ecologically important downstream FEPA Rivers. There are several instream wetland areas within the channels of the larger watercourses that have been mapped as artificial FEPA Wetlands of which only two are located near the proposed works. A natural depression is the only mapped natural FEPA Wetland located in the wider study area but is at least 500 m south of the proposed line in the upper Riet River.

The only aquatic CBA crossed by the proposed transmission line is on the Vanwyks River downstream of the Western Cape Border. This river reach is considered of high ecological importance in terms its unique habitat and linked to terrestrial habitat and vegetation. The remainder of the watercourses are mapped as aquatic Ecological Support Areas (ESAs). Most of the terrestrial areas adjacent to the watercourses in the area are mapped as Other Natural Areas.

Within the Northern Cape CBA, most of the study area is mapped as a CBA, becoming an ESA within the eastern portion of the study area in the Northern Cape.

The rivers within the study area are still in a natural condition in their upper reaches with few modifications (some roads and very small dams). Downstream, in the middle reaches of the Vanwyks, Juk and Oubergs Rivers, the rivers become largely natural to moderately modified. The riparian habitat is slightly more degraded as a result of direct habitat modification from the surrounding farming activities.

The larger watercourses in the study area, the Riet, Vanwyks, Juk and Oubergs Rivers, have a high ecological importance and sensitivity while the smaller tributaries/drainage features are of a moderate ecological importance and sensitivity. The larger watercourses tend to be more ecologically important but less sensitive to impacts while the smaller tributaries are less ecologically important but more sensitive to flow, water quality and habitat modification.

The hillslope seeps and the vernal pools are in a natural ecological condition while the valley bottom wetlands have been slightly modified but are still in a largely natural ecological condition. The floodplains although still largely natural, are the most impacted by the activities within the valley floor. The wetland features are considered of high ecological importance and sensitivity.

The recommended ecological condition of the aquatic features within the study area are that they should be maintained in their current ecological condition and should not be allowed to degrade further. The recommended buffer areas as a development setback from the aquatic features to ensure these aquatic ecosystems are not impacted by the proposed activities are as follows:

- Smaller streams and drainage lines, together with their seeps: at least 50 m from the centre of these streams or the delineated wetland edge (whichever is the furthest);
- The larger rivers within the valley floor, together with their valley bottom wetlands: at least 100 m, measured from the top of bank of the river channels or the delineated wetland edge (whichever is the furthest); and
- The vernal pool and other wetland areas: at least 50 m, measured from the top of bank of the river channels or the delineated wetland edge.

Figure 6 illustrates the rivers associated with the study area. Figure 7 provides an illustration of the aquatic ecology sensitivity associated with the proposed project.

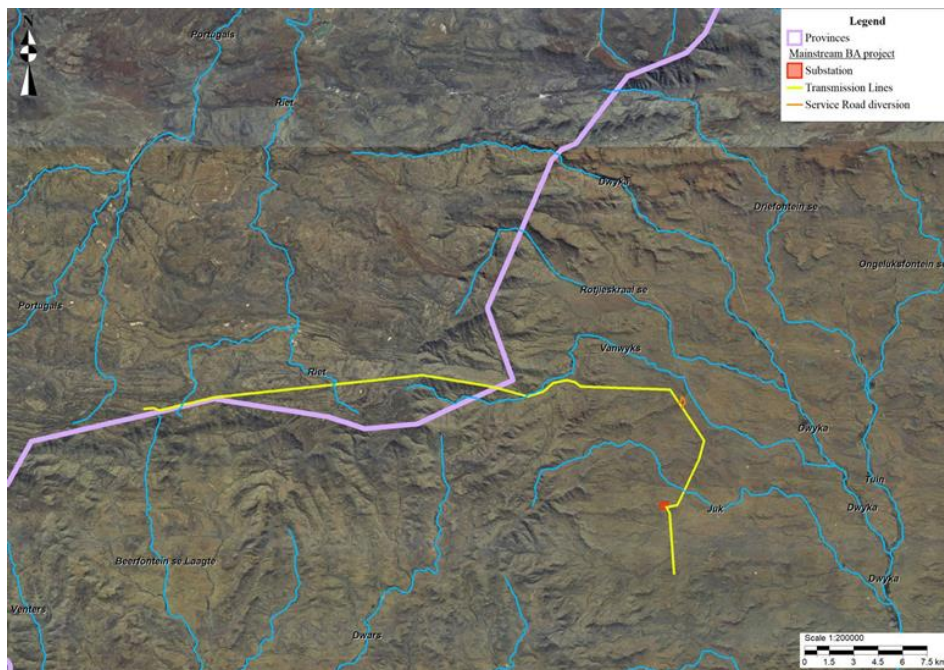


Figure 6: Locality Map of the proposed Electrical Grid Infrastructure relative to Freshwater Features present.

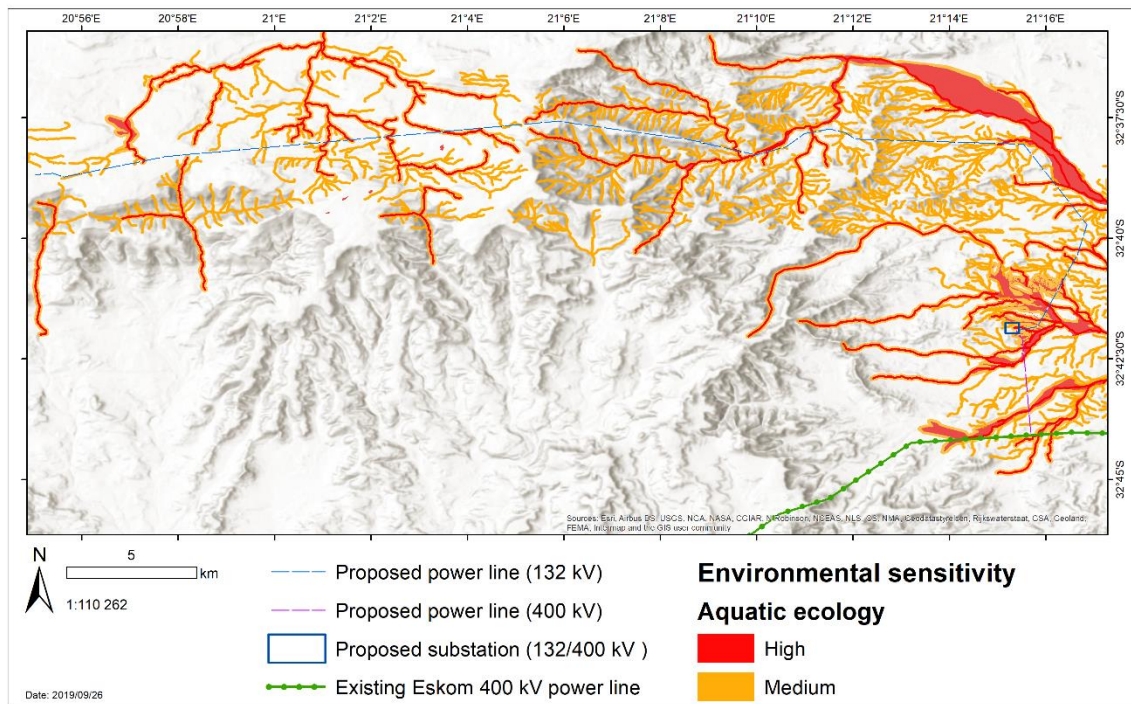


Figure 7: Environmental Sensitivities Map – Aquatic Ecology

The recommended ecological condition of the aquatic features within the study area is that they should be maintained in their current ecological condition and should not be allowed to degrade further. The recommended buffer areas as a development setback from the aquatic features to ensure these aquatic ecosystems are not impacted by the proposed activities, are summarised below:

- Smaller streams and drainage lines, together with their seeps: **at least 50 m from the centre of these streams or the delineated wetland edge (whichever is the furthest);**
- The larger rivers within the valley floor, together with their valley bottom wetlands: **at least 100 m**, measured from the top of the bank of the river channels or the delineated wetland edge (whichever is the furthest), and **32 m for all other drainage lines;**
- The vernal pool and other wetland areas: **at least 50 m**, measured from the top of bank of the river channels or the delineated wetland edge;
- A buffer of at least **32 m between the delineated aquatic ecosystems to the north of the substation footprint and the substation** should be maintained; and
- For all project related components within the site, any aquatic features of high sensitivity (wetland areas and vernal pools) within the immediate area should be demarcated by the appointed Environmental Control Officer (ECO) prior to commencement of the construction activities and treated as **no-go areas during the construction phase.**

These recommended buffers are in line with the watercourse and wetland buffers that have been recommended in the SEA for Wind and Solar Photovoltaic Energy in South Africa (CSIR, 2015) and are deemed appropriate to the aquatic features and the proposed activities within the study area.

5.3. Visual Sensitivities (Visual Receptors)

The Visual Impact Assessment (Appendix D.3 of this BA Report) explains that receptors are important insofar as they inform visual sensitivity. The sensitivity of viewers is determined by the number of viewers and the likelihood that they will be impacted.

Globally it has been noted that many communities, including receptors, may be favourably inclined towards renewable energy projects / infrastructure and may be more predisposed to tolerate impacts they might not have tolerated on other projects. It is difficult to ascribe a level of collective tolerance to receptors, but it is plausible that receptor sensitivity may be muted by the nature of this project.

Holland (2017) notes that very few receptors will be exposed to the proposed power line and substation. Potential viewers include the following:

- **Residents and visitors:** Holland (2017) states that there are approximately 56 buildings within 5 km of the power line although many of the buildings are uninhabited. The power line passes within 1 km of the Waterval farmstead, within 320 m of the farm buildings on Farm Rheebockenfontein (4/1) and within 600 m of the farmstead on Farm Rheebockenfontein (4/2). On the plain below the escarpment, the Komsberg will be a backdrop to the proposed power line for many of the views from farmsteads - the power line is unlikely to be exposed/silhouetted above the skyline for most of the visual receptors on the plain.

Potential (additional) receptors have been identified within 5 km of the 400 kV connection point to the existing 400 kV power line. However, the proposed 400 kV power line is likely to be visually screened by topography or visually absorbed by the existing power line.

- **Motorists:** Motorists using the secondary (gravel) road between Sutherland and Merweville are more than 20 km from the proposed 132 kV power line. The scenic Rooiberg Pass is further than 10 km from the proposed 132 kV power line. The secondary road from Houdenbeck farmstead to the N1 passes within 100 m of the proposed 132 kV power line as the power line approaches the proposed substation. This road is likely to only be used sporadically by farmers. The proposed 400 kV power line will traverse this road.

Figure 8 provides a viewshed of the proposed power line routing, and Figure 9 provides an illustration of the visual sensitivity associated with the proposed project.

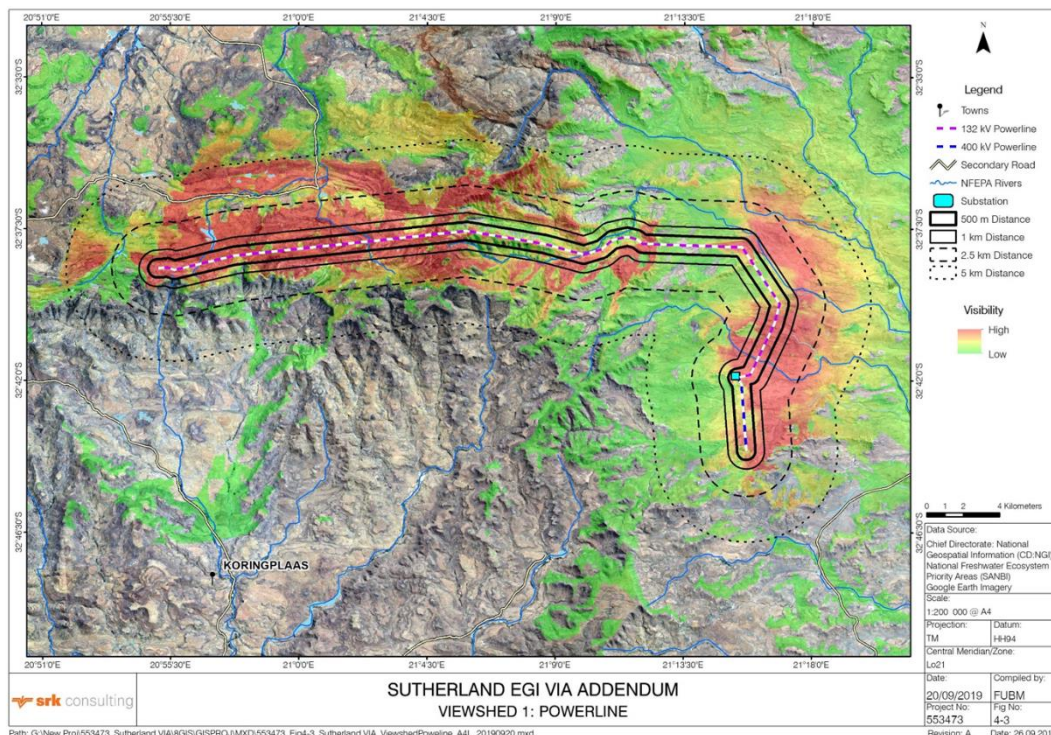


Figure 8: Viewshed of the proposed Power Line Routing

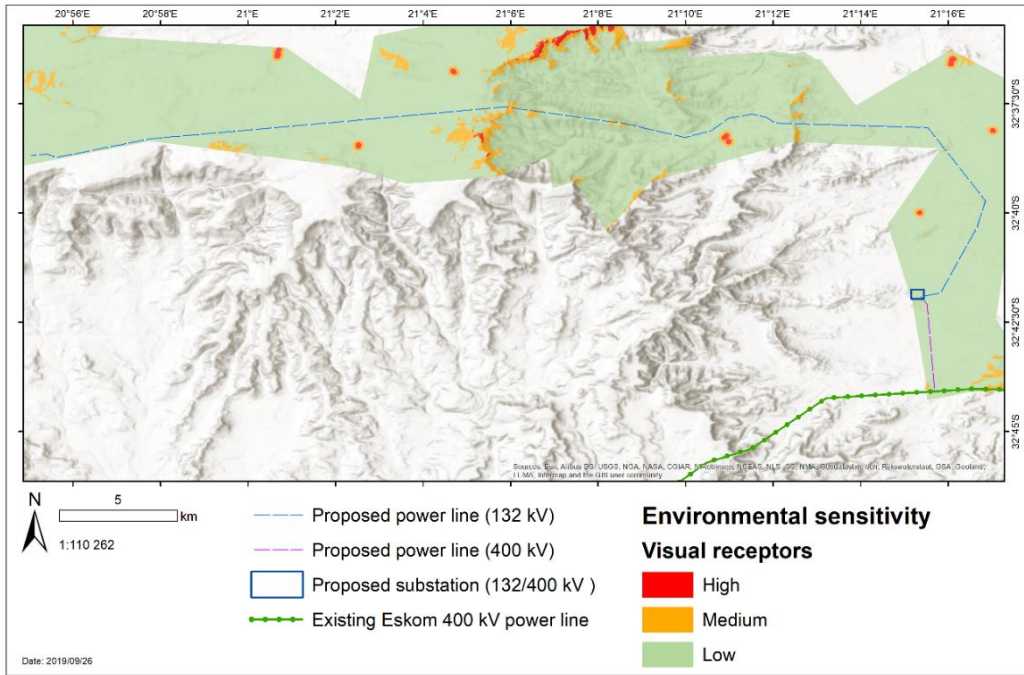


Figure 9: Environmental Sensitivities Map – Visual

5.4. Heritage Environmental Features and Sensitivities

Palaeontology:

The Palaeontology Impact Assessment (PIA) is included as an appendix to the Heritage Impact Assessment (Appendix D.4 of this BA Report). The PIA explains that most of the fossil occurrences found during the specialist site visit were found to be of limited palaeontological value and lie well away from the proposed electrical infrastructure footprint and do not warrant mitigation. However, only one highly-sensitive “no-go” area was identified within the Sutherland WEF Electrical Grid Infrastructure study area, however it lies outside of the proposed development footprint. This specifically includes an **extensive surface scatter of petrified wood blocks, some of which are well-preserved, and occasional bone fragments**, which was found on Farm Hamel Kraal 16 on either side of a farm track. This fossil scatter is located approximately 500 m southwest of the 132 kV power line route (Figure 10). **A 30 m wide peripheral buffer zone is required around the fossil scatter**. No significant fossil remains were recorded at the proposed MTS site. The overall palaeontological sensitivity of the Electrical Grid Infrastructure study area is rated as low. A partially embedded, articulated post-cranial skeleton of a large tetrapod was also found on the Beeren Valley Farm 150, and it is of heritage conservation significance; however, it will not be impacted on by the proposed project, as it lies outside of the project footprint.

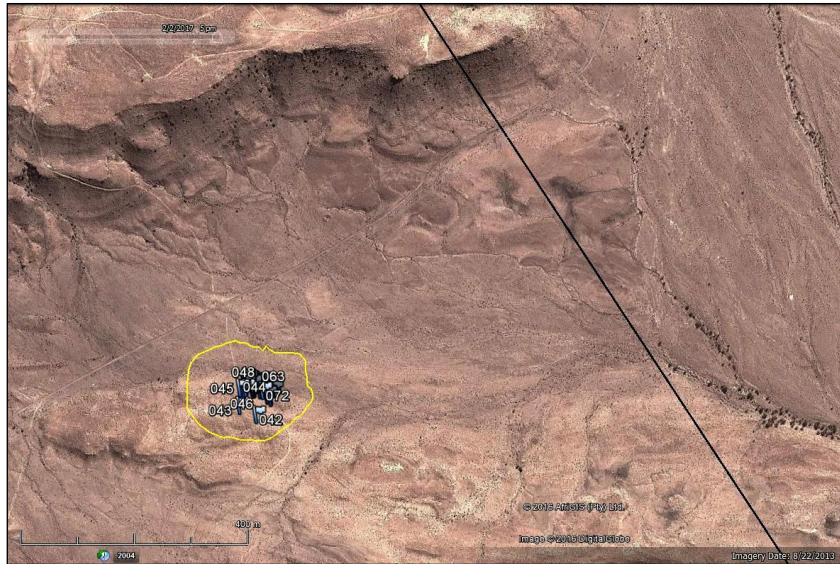


Figure 10: Google earth satellite image of part of Hamel Kraal Farm 16 showing the location of an extensive surface scatter of petrified wood plus occasional bone fragments either side of a farm track (Locs. 041- 074). The yellow polygon outlines a c. 30-m wide peripheral buffer zone around the fossil scatter. The black line c. 500 m to the northeast shows the 132 kV transmission line route.

Archaeology:

The Heritage Impact Assessment (Appendix D.4 of this BA Report) explains that significant archaeological sites (especially the two ruined complexes found around waypoints 498 and 614, as described below) should be identified on project maps and regarded as no-go zones with buffers of at least 30 m around all associated features. The exception to the 30 m buffer is the service road diversion which is routed within 20 m of a rock art site (at waypoint 492); however, the service road uses an existing farm track. There are a number of archaeological sites along both alternatives, as shown in Figures 11 to 13 below. The relevant waypoints to be avoided with buffers of at least 30 m around all associated features are noted below (from west to east). Note that this list only includes those sites located within 500 m of the footprint area.

- **Waypoint 524** includes a small stone structure in a small, steep-sided river valley. Almost certainly a shepherd's hut. The Heritage Impact Assessment notes that it is more intact than many other historical finds. This point does not lie within the proposed power line alignment.
- **Waypoint 546** is a pre-colonial kraal complex with numerous enclosures and stone-walled features (about 27 or 29 in total) scattered around and on top of a low rocky outcrop. A few Stone Age artefacts were found as well as a number of fragments of ostrich eggshell. A few recent items (liquor bottle and a shoe fragment) testify to more recent use of the area. It should be noted that waypoints 528 to 553 inclusive were all at this kraal complex but waypoint 546 is taken as an approximately central location for the site. This complex does not lie along the proposed power line alignment but, importantly, is bisected by one of the farm access roads in the area. This road (passing through the kraal complex) may not be widened towards the east and should preferably not be widened at all.
- **Waypoint 51** includes a historical circular kraal with associated glass and ceramics recorded by Hart et al. (2010). It was given Grade IIIA (on WC system) by them.
- **Waypoint 614** is part of a single historical farm complex, comprising 2.5 x 2 m. It is a small, rectangular stone one-roomed house of beautifully dressed blocks. It has a door facing east, a window facing west and a small 'muurkas' (more of a shelf) in each end wall. There is a cleared area around the house with stones pushed loosely to the edge. There are various loose piles of stones or 'features' around the edge of the cleared area.

- **Waypoint 498** includes a small one-roomed stone house complex with a pitched roof and four rooms (roofs all missing) added to it on the west and south. Two of the rooms on the west have curved walls - an extremely unusual feature. Also two paved surfaces on the north and east sides of the house. Main house has had roof trusses and metal roof sheets added in more recent times (perhaps early-mid-20th century) to allow the structure to continue to be used. Internal plaster was probably also added at this time but is peeling off. Unworked / minimally worked wooden beams used on roofs of added rooms. It is notable that there is no dump in the vicinity of the house and outbuildings. However, there are many fragments of glass, ceramics and metal (including many car parts) scattered in low density over the general area. Much of this material is mid-20th century in age but there is definitely some 19th century material. A fragment of a cobalt blue bottle has “Cape Town” embossed on it. There are also many stone-dressing flakes in the area and many of the blocks in the structures are dressed stones.
- **Waypoint 492** includes a geometric rock art site with eight finger-painted vertical stripes applied to three different ‘canvases’ (small faces on a very irregular surface) which is within 20 m of the service track. No associated artefacts were seen, and no proper rock shelter exists. The site overlooks a river valley. Vehicles and activity must be confined to the existing roads, preferably with no widening.
- **Waypoint 1785** includes a dolomite slab with a historical engraving featuring a circle with dots in it, a “Q” and an “H”. Age presumed to be historical. Although not a site of high significance, the engraving should be avoided (the lines may span over the site). No pylon should be placed within 30 m of the site and it should be fenced with a 30 m buffer during the construction phase.



Figure 11: Overview of the heritage sites within 500 m of the power line route that should be protected and avoided.

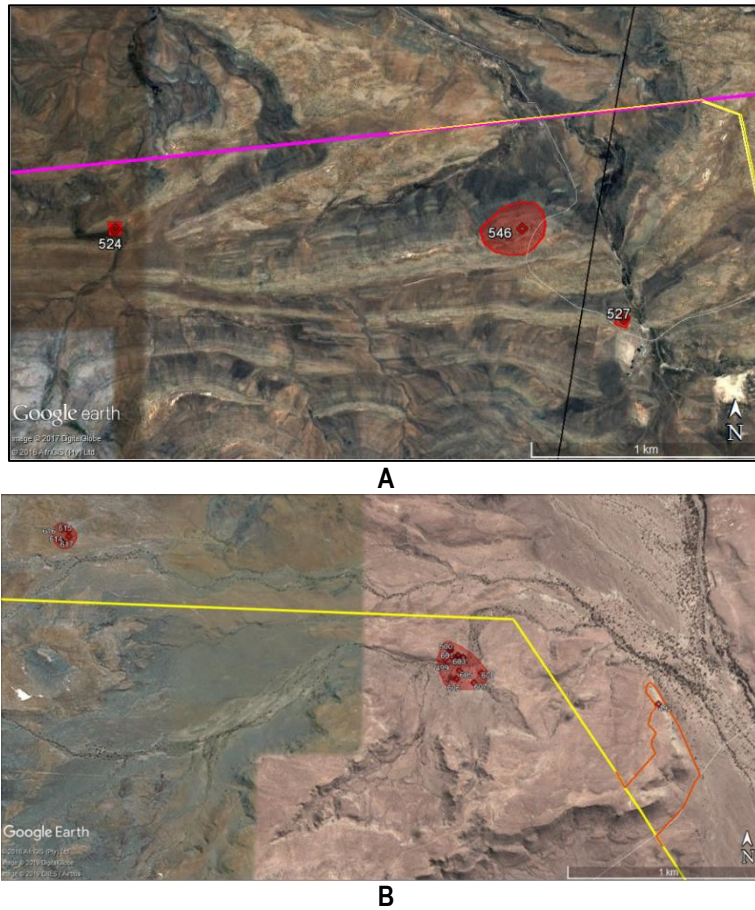


Figure 12: A) Three archaeological sites that should be avoided in Northern Cape (waypoints 524, 546, and 51). The 30 m buffer is only shown on the one that may need active monitoring by the Environmental Control Officer. B) Three archaeological sites that must be avoided in the north-eastern part of the Western Cape section of the route. 30 m buffers are shown on the two ruined historical complexes. The brown line shows the route that will be followed by the service road in that area.

Figure 13 provides an illustration of the heritage sensitivity associated with the proposed project. Note that the red circles in Figure 13 are indicative of broad location at coarse scale only, and not the actual extent of recorded heritage features.

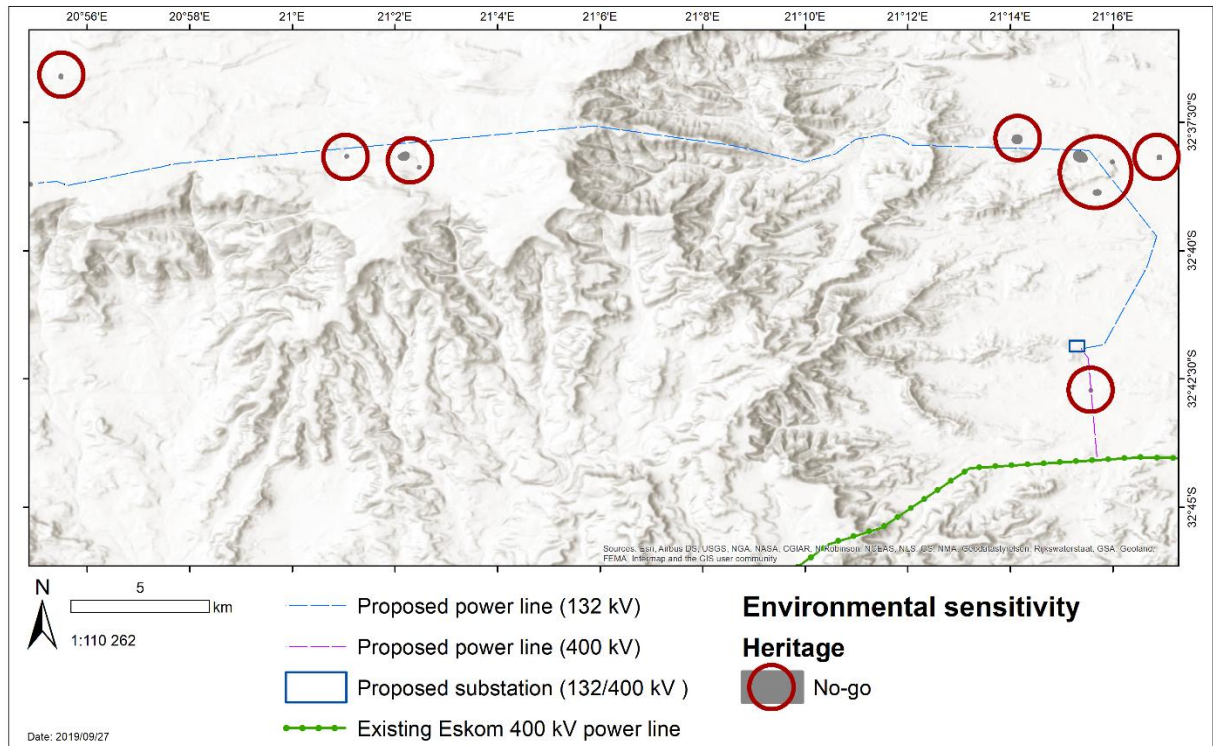


Figure 13: Environmental Sensitivities Map - Heritage

5.5. Avifauna (Bird) Sensitivities

The following environmental sensitivities have been identified from an avifaunal perspective (as noted in the Avifauna Impact Assessment (Appendix D.5 of this BA Report), as shown in Figure 14 below:

- **No-go areas:** These are areas in close proximity to known active Verreaux’s Eagle and Jackal Buzzard nests, where the construction of the proposed power line and associated infrastructure will constitute a disturbance risk. **No such areas will be impacted by the proposed alignment.**
- **High sensitivity:** Included are areas within 300 m of small waterbodies, and within 500 m of large waterbodies (both artificial dams and natural pans), where the proposed power line will constitute a collision risk. These areas should ideally be avoided, or if this is not possible, there should be adequate mitigation implemented to reduce the risks materially (see Section 7 of the Avifauna Impact Assessment in Appendix D.5) for a discussion of proposed mitigation measures). Red Data species that could be impacted through collisions with the proposed power line due to being attracted to the surface water include Greater Flamingo, Black Stork and raptors such as Martial Eagle and Verreaux’s Eagle. Many non-Red Data power line sensitive species could also be attracted to surface water and be at risk of collisions e.g. various species of raptors, ducks, herons, grebes and waders. Ephemeral drainage lines and their immediate environments are also included in this category. When these ephemeral drainage lines contain water, they serve as flyways for waterbirds, and may temporarily attract Red Data species such as Black Stork, while standing pools of water could attract raptors for purposes of drinking and bathing, e.g. Red Data Martial Eagle and Verreaux’s Eagle as well as non-Red Data raptors. These areas should likewise ideally be avoided, or if this is not possible, there should be adequate mitigation implemented to reduce the risks materially, e.g. marking with anti-collision devices.
- **Medium sensitivity:** The entire study area can be classified as medium-sensitive. The area is largely untransformed, and the natural habitat supports a number of Red Data power line sensitive species, notably Ludwig’s Bustard and Karoo Korhaan. Ludwig’s Bustard in particular is known to be highly susceptible to power line collisions.

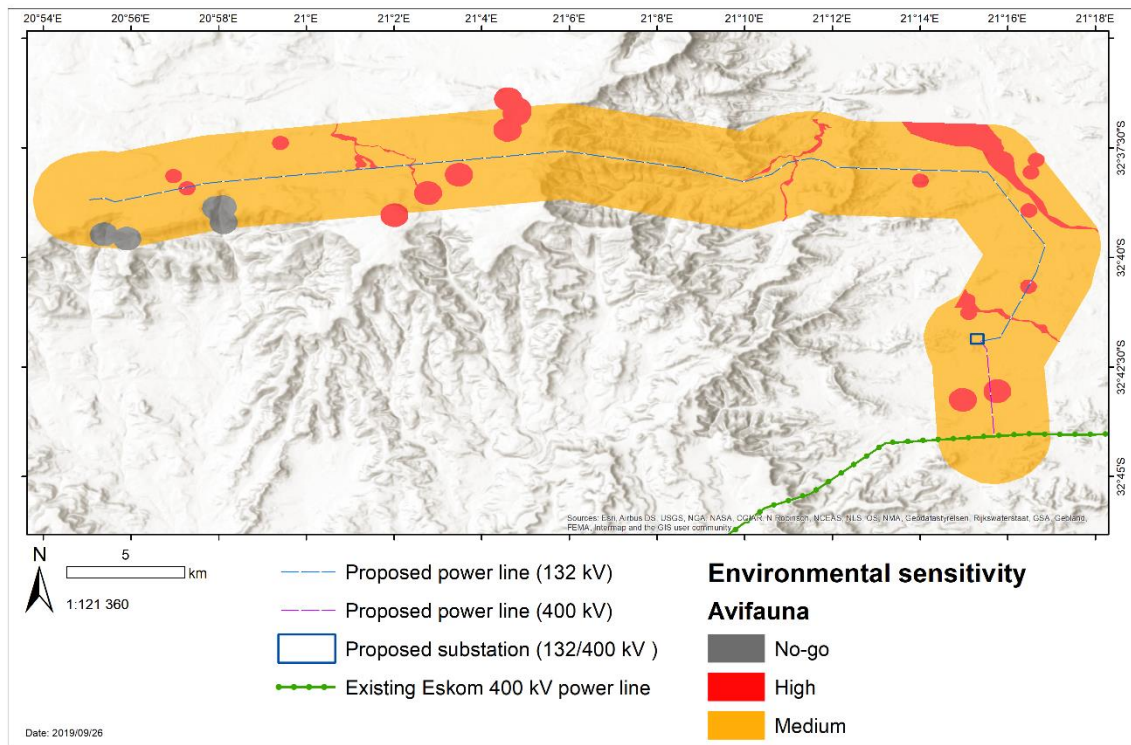


Figure 14: Sensitive areas from an avifaunal impact perspective for the proposed Electrical Grid Infrastructure BA

5.6. Agricultural Sensitivities

In terms of the sensitivity categories used in the REDZ sensitivity analysis, this site was assessed as having low sensitivity (DEA, 2015).

Agricultural sensitivity of a particular development is also a function of the severity of the impact which that development poses to agriculture. In the case of power lines, the impact is negligible (see impact assessment section on Agriculture in Section D). This even further reduces the agricultural sensitivity of the study area for the proposed development.

The entire study area has extremely low agricultural potential and therefore very low agricultural sensitivity to development and consequent loss of agricultural land use. Agricultural potential and conditions are also very uniform across the site, and the choice of placement of facility infrastructure therefore has negligible influence on the significance of agricultural impacts. From an agricultural point of view, no parts of the site need to be avoided by the proposed development and no buffers are required.

Therefore, overall, the proposed project infrastructure does not intersect with any no-go areas identified by the specialists, and where areas of high sensitivity will be traversed by the proposed project components, relevant mitigation measures have been recommended to reduce the significance of the potential impacts. It is important to note that the specialists have not identified any no-go areas or fatal flaws associated with the proposed project.

Should the preferred location of the proposed MTS, O&M building and laydown area change subsequent to the issuing of an EA (should such authorisation be granted), any alternative layout/location or revisions thereto occurring within the boundaries of the development envelope would not be regarded as a change to the scope of work or the findings of the impact assessments

undertaken during the BA Phase. This is based on the understanding that the specialists have assessed the larger area and have identified sensitivities, which will largely be avoided in the final siting of the proposed infrastructure. This will be confirmed with the competent authority when such change/s will be considered.

In addition, the proposed specific locations of the pylon structures will be confirmed and determined by Mainstream during the detailed engineering phase, taking into consideration the environmental sensitivities and features identified as part of this BA process, as described above.

6. MAPPING AND SITE PHOTOGRAPHS

Refer to Appendix A.1 of this BA Report for project Locality Maps that provide an accurate indication of the proposed project site, as well as existing access roads and the closest town. Appendix A.2 of this BA Report includes a Layout/Route Map of the proposed infrastructure, including property boundaries. Appendix A.3 of this BA Report includes an Environmental Features Map, which shows the relevant environmental features identified on site by the specialists. In addition, Appendix A.4 of this BA Report includes a Sensitivity Map, which shows those environmental features, and areas that are considered to be of high sensitivity and no-go areas. Both the Environmental Features and Sensitivity Maps also indicate the proposed Electrical Grid Infrastructure.

In terms of site photographs, five photograph points which best represent the proposed project area were selected. Photographs were taken in the eight major compass directions at each photograph point. The co-ordinates of the photograph points are shown below:

- Photograph Point 1 - 32° 36' 18.76" S and 21° 0' 41.63" E
- Photograph Point 2 - 32° 35' 24.40" S and 21° 2' 53.87" E
- Photograph Point 3 - 32° 42' 7.90" S and 21° 16' 7.13" E
- Photograph Point 4 - 32° 40' 34.66" S and 21° 16' 30.84" E
- Photograph Point 5 - 32° 38' 32.13" S and 21° 15' 57.73" E

Additional photographs were also taken and included in Appendix B of the BA Report, as well as in the relevant specialist studies in Appendix D of this BA Report. In addition, Appendix C of this BA Report includes **indicative** drawings of the proposed pylon structures being considered for the proposed 132 kV and 400 kV power lines. As noted above, specifications may change during the detailed engineering phase.

7. DESCRIPTION OF THE LISTED ACTIVITIES ASSOCIATED WITH THE PROPOSED PROJECT

Section 24(1) of the NEMA states: "In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant EA." The reference to "listed activities" in Section 24 of the NEMA relates to the regulations promulgated in GN R326, R327, R325 and R324, dated 7 April 2017. The relevant GN published in terms of the NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a BA or Scoping and EIA be conducted. As noted above, the proposed project requires a BA process.

As noted above, the proposed project falls within the REDZ 2 (i.e. Komsberg) and the Central Power Corridor. Developers proposing to submit applications for EA for large scale electricity transmission infrastructure within any of the five Strategic Transmission Corridors, that trigger Listed Activity 9 of Listing Notice 2 of the 2014 EIA Regulations, as amended, or any other listed and specified activities that are necessary for the realisation of such infrastructure and facilities, would need to follow a BA process in terms of the 2014 EIA Regulations, as amended, as opposed to a full Scoping and EIA Process, which is required for all activities listed in Listing Notice 2. The decision-making timeframe has also been reduced from 107 days to 57 days.

Therefore, since the proposed project falls within the Central Power Corridor, based on the above, the Mainstream electrical infrastructure project is subjected to a BA Process.

The Application for EA for this BA process will be submitted to the DEFF together with this Draft BA Report, which makes reference to all relevant listed activities forming part of the proposed development.

Table 4 below provides a list of the applicable listed activities associated for the proposed project in terms of Listing Notice 1 (GN R 327), Listing Notice 2 (GN R 325) and Listing Notice 3 (GN R324) in terms of the 2014 NEMA EIA Regulations, as amended.

Table 4: Applicable Listed Activities

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
GN R327	
<p>GN R327: Activity 11 (i)</p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity:</p> <ul style="list-style-type: none"> ▪ (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts. 	<p>The proposed project will entail the construction and installation of an overhead 132 kV power line, extending approximately 41 km long, from the proposed authorised Sutherland WEF on-site substation to the proposed MTS (including tower/pylon infrastructure and foundations). The proposed project will take place outside of an urban area.</p>
<p>GN R327: Activity 12 (ii)</p> <p>The development of -</p> <ul style="list-style-type: none"> ▪ (ii) infrastructure or structures with a physical footprint of 100 square metres or more; ▪ (a) within a watercourse; ▪ (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding:</p> <ul style="list-style-type: none"> ▪ (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; ▪ (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; ▪ (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; ▪ (dd) where such development occurs within an urban area; ▪ (ee) where such development occurs within existing roads, road reserves or railway line reserves; or ▪ (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared. 	<p>The proposed project will entail the construction and installation of a MTS (400 m x 400 m; including Operation and Maintenance (O&M) building and laydown area). It will also entail the construction and installation of an overhead 132 kV power line, extending approximately 41 km long, from the proposed authorised Sutherland WEF on-site substation to the MTS (including tower/pylon infrastructure and foundations). It also includes the construction and operation of an overhead 400 kV power line, extending approximately 4 km long from the proposed MTS connecting to an existing Eskom 400 kV power line.</p> <p>The MTS will cover an approximate area less than 20 ha. Foundations for the pylons and towers of the power line will also be constructed. Gravel service roads will be constructed below the power line, with a small deviation from below the power line to avoid a sensitive heritage feature. The proposed service roads will extend approximately 4 - 6 m wide and 45 km long.</p> <p>This constitutes infrastructure and structures with a physical footprint of more than 100 m² that could possibly be constructed within or within 32 m of watercourses found on site. The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report) that has been undertaken as part of the BA process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project.</p> <p>While the extreme western extent of the power line starts within the Portugals River Catchment, it does not cross any of the associated watercourses. Within this section of the power line, the line only crosses the</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
	<p>Riet River tributaries along the high lying areas at the very upper reaches of the watercourses.</p> <p>Towards the middle section of the western section, the power line crosses the upper Riet River and its tributaries and then passes eastwards along a ridge between two tributaries of the Vanwyks River.</p> <p>Towards the eastern section, the power line crosses the middle reaches of the Vanwyks River, its tributaries and the associated valley bottom and floodplain wetlands. The service road deviation is also located within this section, directly adjacent to the floodplain of the Vanwyks River.</p> <p>The power line also crosses the middle reaches of the Vanwyks, Juks and Oubergs Rivers, its tributaries and the associated valley bottom and floodplain wetlands.</p> <p>The proposed location of the MTS is within the upper to middle reaches of Juks River. It has been located to try and avoid the watercourses as far as possible and only a few minor watercourses occur within the footprint.</p> <p>As shown in Table 16 of the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report), infrastructure associated with the proposed project could possibly be constructed within or within 32 m of the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas.</p>
<p><u>GN R327: Activity 19</u></p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving -</p> <ul style="list-style-type: none"> ▪ (a) will occur behind a development setback; ▪ (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; ▪ (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; ▪ (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or ▪ (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies. 	<p>The proposed project may entail the excavation, removal and moving of possibly more than 10 m³ of soil, sand, pebbles or rock from the nearby watercourses. The proposed project may also entail the infilling or depositing of more than 10 m³ of material into the nearby watercourses. This infilling and excavation of the material will occur as a result of the proposed construction of the power line, MTS and service roads.</p> <p>The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2) that has been undertaken as part of the BA process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project. Infilling of material or excavating of material could possibly occur from these aquatic features.</p> <p>Details of the infilling of material or excavating of material will be confirmed during the detailed design phase.</p>
<p><u>GN R327: Activity 27</u></p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p>	<p>The proposed project will entail the construction of a MTS (including a laydown area and O&M building), which will cover an approximate area of less than 20 ha. As a result, more than 1 ha of indigenous vegetation could possibly be removed for the construction of these structures.</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
<ul style="list-style-type: none"> ▪ the undertaking of a linear activity; or ▪ maintenance purposes undertaken in accordance with a maintenance management plan. 	<p>The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses has been identified as a potential impact in the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report). Recommended mitigation measures have been provided.</p> <p>The presence of indigenous vegetation on site is determined in the Terrestrial Ecology Impact Assessment (Appendix D.1 of the BA Report) that has been undertaken as part of this BA process. The study explains that the initial section of the power line on the plateau is classified as Roggeveld Shale Renosterveld. The central section of the 132 kV line is Central Mountains Shale Renosterveld and the final section of 132kV line as well as the substation and 400 kV line fall within the Gamka Karoo vegetation type.</p>
<p><u>GN R327: Activity 28 (ii)</u></p> <p>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development:</p> <ul style="list-style-type: none"> ▪ (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; <p>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</p>	<p>As noted above, the proposed project will take place outside of an urban area, on several farm portions within the Northern and Western Cape. It is understood that the land is currently used for agricultural purposes. The proposed project, which is considered to be a commercial/industrial development, will entail the construction of a MTS, 132 kV and 400 kV power lines (including towers and pylons), service roads, and associated infrastructure. This will constitute infrastructure with a physical footprint of more than 1 ha outside of an urban area.</p>
<u>GN R325</u>	
<p><u>GN R325: Activity 9</u></p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is –</p> <ul style="list-style-type: none"> ▪ (a) temporarily required to allow for maintenance of existing infrastructure; ▪ (b) 2 kilometres or shorter in length; ▪ (c) within an existing transmission line servitude; and ▪ (d) will be removed within 18 months of the commencement of development. 	<p>The proposed project will entail the construction and installation of an overhead 400 kV power line, approximately 4 km, which will transfer electricity to an existing Eskom 400 kV power line. It will also entail the construction and installation of a MTS (400 m x 400 m, including an O&M Building and Laydown Area) as well as associated infrastructure in order to facilitate connection to the national grid. The proposed project will take place outside of an urban area.</p> <p>Note from the CSIR: Refer to Section D of the BA Report for a description of the streamlined EA process that is being followed as a result of the proposed project site falling within the gazetted Central Power Corridor.</p>
<u>GN R324</u>	
<p><u>GN R324: Activity 4</u></p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <ul style="list-style-type: none"> ▪ (g) Northern Cape: ▪ ii. Outside urban areas, in: 	<p>As noted above, the proposed project will take place outside of an urban area, on several farm portions within the Northern and Western Cape. Gravel service roads will also be constructed below the power line, with a small deviation from below the power line to avoid a sensitive heritage feature. The service roads will extend approximately 4 - 6 m wide and 45 km long.</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
<ul style="list-style-type: none"> ▪ (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; ▪ (i) Western Cape: ▪ ii. Areas outside urban areas; in: ▪ (aa) Areas containing indigenous vegetation 	<p>As noted above, the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of this BA Report) that has been undertaken as part of the BA Process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project.</p> <p>The Riet River at the power line crossing is mapped as an aquatic CBA towards the west, Ecological Support Area (ESA) further east, and is within an Upstream Freshwater Ecosystem Priority Areas (FEPA) sub-catchment. The middle reaches of the Vanwyks River, where valley bottom wetland areas occur, the river is mapped as an aquatic CBA, while the remainder of the watercourses are aquatic ESAs. The power line also crosses the middle reaches of the Vanwyks, Juks and Oubergs Rivers, its tributaries and the associated valley bottom and floodplain wetlands. The middle reaches of these rivers are mapped as aquatic ESAs and they are within an Upstream FEPA sub-catchment.</p> <p>As noted in the Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report), there are some short sections of the power line route within the Western Cape that are CBA 1 associated with water courses. Within the Northern Cape, a large part of the route is either CBA 1 or CBA 2. Development within CBAs can have negative impacts on biodiversity pattern and process and is generally considered undesirable. The footprint within the CBAs would however be low and the ecological functioning of the CBAs would not be compromised by the proposed development. Overall the impact of the development on CBAs and broad-scale ecological processes would be low and no major impacts on ecological processes would occur.</p> <p>The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses has been identified as a potential impact in the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report). Recommended mitigation measures have been provided.</p> <p>The presence of indigenous vegetation on site is determined in the Terrestrial Ecology Impact Assessment (Appendix D.1 of the BA Report) that has been undertaken as part of this BA process. The study explains that the initial section of the power line on the plateau is classified as Roggeveld Shale Renosterveld. The central section of the 132 kV line is Central Mountains Shale Renosterveld and the final section of 132 kV line as well as the substation and 400 kV line fall within the Gamka Karoo vegetation type.</p> <p>However, it should be noted that no fatal flaws have been identified by the specialists for the proposed project, and relevant mitigation measures have been recommended to reduce the significance of impacts on the surrounding environment.</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
<p>GN R324: Activity 12</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <ul style="list-style-type: none"> ▪ (g) Northern Cape: <ul style="list-style-type: none"> ▪ ii. Within critical biodiversity areas identified in bioregional plans ▪ (i) Western Cape: <ul style="list-style-type: none"> ▪ ii. Within critical biodiversity areas identified in bioregional plans. 	<p>The proposed project will entail the construction of a MTS, power line (including towers and pylons), and service roads. As a result, more than 300 m² of indigenous vegetation could possibly be removed for the construction of these structures.</p> <p>The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses has been identified as a potential impact in the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report). Recommended mitigation measures have been provided.</p> <p>The presence of indigenous vegetation on site is determined in the Terrestrial Ecology Impact Assessment (Appendix D.1 of the BA Report) that has been undertaken as part of this BA process. The study explains that the initial section of the power line on the plateau is classified as Roggeveld Shale Renosterveld. The central section of the 132 kV line is Central Mountains Shale Renosterveld and the final section of 132 kV line as well as the substation and 400 kV line fall within the Gamka Karoo vegetation type.</p> <p>As noted above, the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of this BA Report) that has been undertaken as part of the BA Process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project.</p> <p>The Riet River at the power line crossing is mapped as an aquatic CBA towards the west, ESA further east, and is within an Upstream FEPA sub-catchment. The middle reaches of the Vanwyks River, where valley bottom wetland areas occur, the river is mapped as an aquatic CBA, while the remainder of the watercourses are aquatic ESAs. The power line also crosses the middle reaches of the Vanwyks, Juks and Oubergs Rivers, its tributaries and the associated valley bottom and floodplain wetlands. The middle reaches of these rivers are mapped as aquatic ESAs and they are within an Upstream FEPA sub-catchment.</p> <p>As noted in the Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report), there are some short sections of the power line route within the Western Cape that are CBA 1 associated with water courses. Within the Northern Cape, a large part of the route is either CBA 1 or CBA 2. Development within CBAs can have negative impacts on biodiversity pattern and process and is generally considered undesirable. The footprint within the CBAs would however be low and the ecological functioning of the CBAs would not be compromised by the proposed development. Overall the impact of the development on CBAs and broad-scale ecological processes would be low and no major impacts on ecological processes would occur.</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
	<p>However, it should be noted that no fatal flaws have been identified by the specialists for the proposed project, and relevant mitigation measures have been recommended to reduce the significance of impacts on the surrounding environment.</p>
<p>GN R324: Activity 14</p> <p>The development of -</p> <ul style="list-style-type: none"> ▪ (ii) infrastructure or structures with a physical footprint of 10 square metres or more; <p>where such development occurs -</p> <ul style="list-style-type: none"> ▪ (a) within a watercourse; ▪ ; or ▪ (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour:</p> <ul style="list-style-type: none"> ▪ (g) Northern Cape: ▪ ii. Outside urban areas, in: <ul style="list-style-type: none"> ▪ (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. ▪ (i) Western Cape: ▪ i. Outside urban areas: <ul style="list-style-type: none"> ▪ (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; 	<p>The proposed project will entail the construction and installation of a MTS (400 m x 400 m; including O&M building and laydown area). It will also entail the construction and installation of an overhead 132 kV power line, extending approximately 41 km long, from the proposed authorised Sutherland WEF on-site substation to the MTS (including tower/pylon infrastructure and foundations). It also includes the construction and operation of an overhead 400 kV power line, extending approximately 4 km long from the proposed MTS connecting to an existing Eskom 400 kV power line.</p> <p>The MTS will cover an approximate area less than 20 ha. Foundations for the pylons and towers of the power line will also be constructed. Gravel service roads will be constructed below the power line, with a small deviation from below the power line to avoid a sensitive heritage feature. The proposed service roads will extend approximately 4 - 6 m wide and 45 km long.</p> <p>This constitutes infrastructure and structures with a physical footprint of more than 100 m² that could possibly be constructed within or within 32 m of watercourses found on site. The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report) that has been undertaken as part of the BA process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project.</p> <p>While the extreme western extent of the power line starts within the Portugals River Catchment, it does not cross any of the associated watercourses. Within this section of the power line, the line only crosses the Riet River tributaries along the high lying areas at the very upper reaches of the watercourses.</p> <p>Towards the middle section of the western section, the power line crosses the upper Riet River and its tributaries and then passes eastwards along a ridge between two tributaries of the Vanwyks River.</p> <p>Towards the eastern section, the power line crosses the middle reaches of the Vanwyks River, its tributaries and the associated valley bottom and floodplain wetlands. The service road deviation is also located within this section, directly adjacent to the floodplain of the Vanwyks River.</p> <p>The power line also crosses the middle reaches of the Vanwyks, Juks and Oubergs Rivers, its tributaries and the associated valley bottom and floodplain wetlands.</p>

Listed Activity (GN R327, GN 325 and R324)	Description of Project Activity that triggers Listed Activity
	<p>The proposed location of the MTS is within the upper to middle reaches of Juks River. It has been located to try and avoid the watercourses as far as possible and only a few minor watercourses occur within the footprint.</p> <p>As shown in Table 16 of the Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of the BA Report), infrastructure associated with the proposed project could possibly be constructed within or within 32 m of the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas.</p>

It must be noted that the above listed activities have been identified in line with the following:

- It is proposed that less than 30 m³ of dangerous goods (such as petrol and diesel) will be temporarily stored on site during the construction phase. Furthermore, no infrastructure or structures are planned to be specifically constructed for the afore-mentioned temporary storage. Recommendations for the temporary storage of petrol and diesel on site during the construction phase have been provided in the EMPr (Appendix F of this BA Report).

8. DESCRIPTION OF ALTERNATIVES

This section discusses the alternatives that have been considered as part of this BA process. Sections 24(4) (b) (i) and 24(4A) of the NEMA require an Environmental Assessment to include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24O (1)(b)(iv) also requires that the Competent Authority, when considering an application for EA, takes into account “where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment”.

Therefore, the assessment of alternatives should, as a minimum, include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

Compliance with Regulation 3 (1) (h) (i) of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) is discussed below. Regulation 2 (e) of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) states:

- The objective of the basic assessment process is to, through a consultative process, and through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

8.1. Property or Location Alternatives (i.e. Site Alternatives)

It is important to note that the location of the proposed power line and service roads, as well as the other associated infrastructure, is dictated by and dependent on the location of the proposed and authorised WEFs, and therefore certain alternatives are not applicable or feasible, as discussed and motivated further below.

Therefore, the main factors that determined the location of the proposed 132 kV and 400 kV power lines and supporting electrical infrastructure are indicated below and discussed within this section:

- Location of the proposed and authorised WEFs that will be connected to the national grid via the proposed supporting electrical infrastructure;
- Location of the proposed MTS;
- Cooperative landowners; and
- Environmental sensitivities identified by the specialists.

As discussed previously, the overall aim of this proposed project is to provide the necessary electrical infrastructure to ensure that the proposed WEFs are equipped and enabled to transmit the generated electricity (from the WEFs) to the MTS. The determination of the location and properties over which the proposed power line and associated supporting electrical infrastructure will be constructed was therefore largely dependent on the location of the WEFs, as approved as part of previous EAs (DEA Reference Numbers: 12/12/20/1782/1/AM2; 12/12/20/1782/2/AM2 and 12/12/20/1782/3/AM2). In turn, the best routing of the proposed power line from the proposed WEF sites to the MTS was based on environmental sensitivities, and the willingness of landowners to provide consent for the construction of the proposed Electrical Grid Infrastructure on their land. Therefore, alternative routing options for the proposed power line were considered to determine the most acceptable and preferred routing. The sensitive areas identified by the specialists have been largely taken into consideration in determining the routing of the proposed power line and service roads, as shown in Appendix A of this BA Report.

The approximate centre-point location of the proposed MTS is located at 32° 41' 51,998" S and 21° 15' 18,445" E.

Based on the above, site alternatives and power line routing options for this proposed BA project are not applicable. However, in the previous BA Reports for the proposed electrical grid infrastructure to support the proposed Rietrug, Sutherland and Sutherland 2 WEFs (CSIR, 2017) **two** alternative power line routings were assessed by the specialists, i.e. Alternative 1 and Alternative 2. These alternatives are discussed below and illustrated in Figure 15A:

- Alternative 1 of the grid connection was to route to the proposed 132 kV Suurplaat on-site substation (referred to as the proposed collector hub), located on the Farm Hartebeeste Fontein in the Northern Cape.
- Alternative 2 of the grid connection was to route to the proposed 400 kV Eskom Main Transmission Substation (also known as the proposed Eskom Nuwerust Substation), located on Farm Hamelkraal in the Western Cape.

The actual proposed third-party and Eskom substations were not included within the scope of the previous BA Processes. Alternative 1 was the preferred alternative and thus was approved in the EAs in February and March 2018. However, Alternative 2 of the grid connection routing was also assessed in the BA Processes, was deemed acceptable, and it did not present any environmental fatal flaws. Overall, it must be noted that both Alternatives 1 and 2, which were previously assessed are considered suitable and do not display any environmental flaws, as summarised in Table 5 below (Table 21 of the previous Final BA Reports).

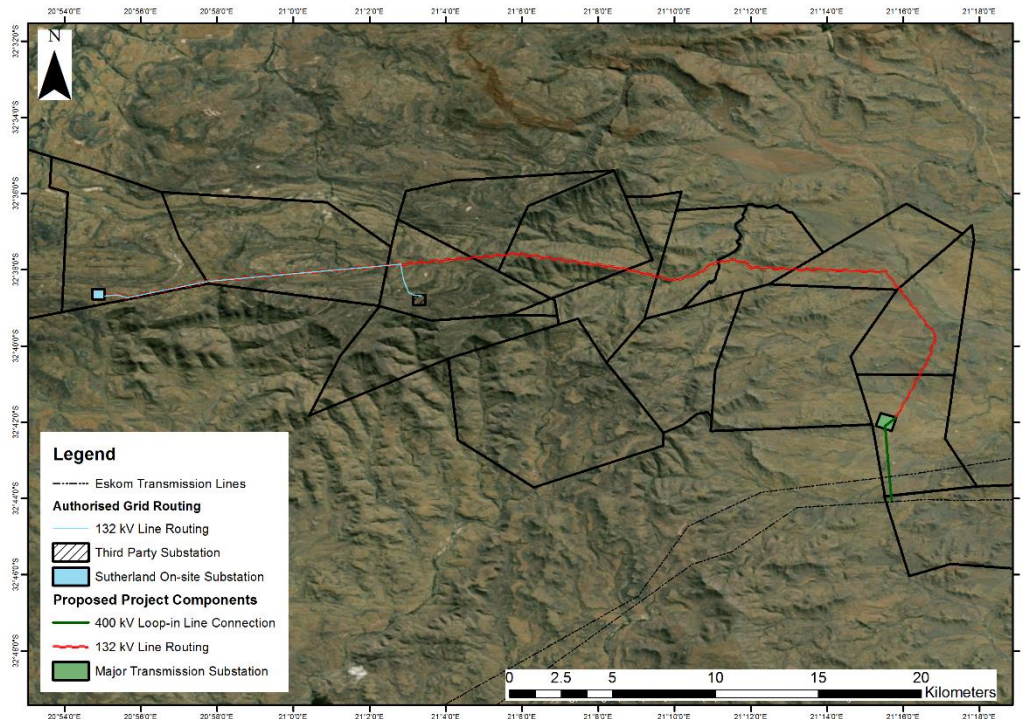
Table 5: Assessment undertaken in previous BAs for Electrical Grid Infrastructure for Alternative 1 and Alternative 2 power line routing (CSIR, 2017)

Specialist Study	Alternative 1	Alternative 2
Terrestrial Ecology Impact Assessment	Preferred (and acceptable with no fatal flaws)	Acceptable with no fatal flaws
Aquatic Ecology (Freshwater) Impact Assessment	Acceptable, no fatal flaws, and no specific preference from an Aquatic Ecology perspective.	Acceptable, no fatal flaws, and no specific preference from an Aquatic Ecology perspective.
Visual Impact Assessment	Preferred (and acceptable with no fatal flaws)	Acceptable with no fatal flaws
Heritage Impact Assessment (Archaeology and Cultural Landscape)	Preferred (and acceptable with no fatal flaws)	Acceptable with no fatal flaws
Heritage Impact Assessment (Palaeontology)	Acceptable, no fatal flaws, and no specific preference based on palaeontological grounds.	Acceptable, no fatal flaws, and no specific preference based on palaeontological grounds.
Avifauna Impact Assessment	Preferred (and acceptable with no fatal flaws)	Acceptable with no fatal flaws

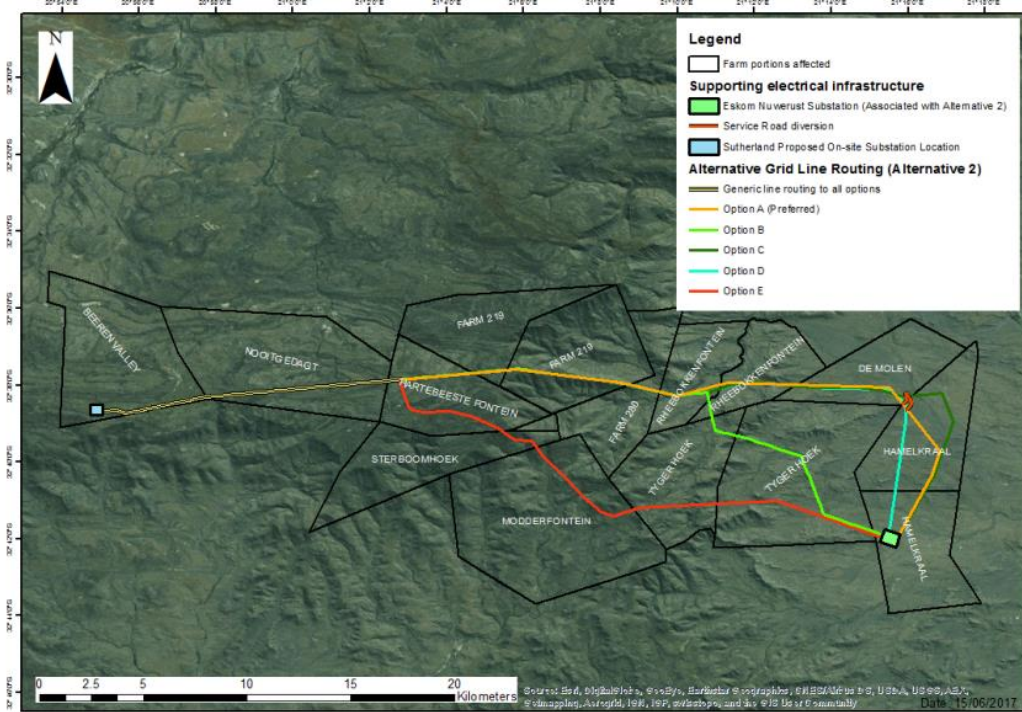
However, currently Mainstream wishes to connect to Alternative 2 and to seek EA for Alternative 2, as well as for the construction of the MTS and 400 kV power line to the existing Eskom power line, and all associated infrastructure, because it allows more stability in terms of evacuation to the National Grid. As discussed with the DEFF during the pre-application meeting in May 2019 (Refer to Appendix I.2 of this Draft BA Report for a copy of the agenda, minutes and signed attendance register of the pre-application meeting), the reason for this is purely based on technical considerations since neither of the two routing options that were assessed as part of the previous BA Processes have environmental fatal flaws. The REIPPPP requires that a project has a feasible grid connection. The approved Alternative 1 power line routing was routed to a third-party owned substation, which is yet to be constructed and is dependent on the third-party receiving preferred bidder status.

The proposed Suurplaat WEF is owned by a third-party, who will construct the proposed Suurplaat substation that will enable the connection of the Mainstream projects to the third-party substation (considered as part of Alternative 1 above). However, both the third-party developer and Mainstream will submit a bid in the next REIPPPP. Should the proposed Suurplaat project not win, and Mainstream's project(s) do, then Mainstream will not have a feasible grid connection since the third-party substation will not be constructed. To ensure more stability, Mainstream has therefore commissioned this BA Process to ensure that the proposed Sutherland, Sutherland 2 and Rietrug WEFs are able to connect to the National Grid in a stable manner that is not dependent on third-parties. Mainstream therefore needs to submit a feasible grid option as part of their bid. The current proposal (i.e. the subject of this BA) is feasible.

In the previous BAs undertaken (CSIR, 2017) five routing options were considered for the Alternative 2 power line routing from the proposed Sutherland on-site substation to the proposed Eskom Nuwerust Substation. These five routing options are noted below and shown in Figure 15B below.



A



B

Figure 15: A) Previously authorised “Alternative 1” Power Line Routing shown in blue and currently assessed power line routing shown in red (previously assessed “Alternative 2”) and green. B) Five Options considered in the initial BAs for the routing of the proposed power line for Alternative 2 from the Sutherland on-site substation to the Eskom Nuwerust Substation (CSIR, 2017).

As indicated in Figure 15B above:

- Option A - This is the preferred routing option and it was recommended by the specialists on the BA Team, in consultation with Mainstream, taking into consideration the constraints on site in terms of sensitive environmental and topographical features. Note that this currently serves as the preferred routing option that is currently being assessed as part of this BA Process.
- Option B - This is the routing that was indicated in the Background Information Document, which was made available for public comment from 9 December 2016 to 1 February 2017, as part of the previous 2016 - 2017 BA Processes. This routing was recommended by Mainstream based on environmental constraints and feasibility from a construction point of view.
- Option C - This is a routing option that was recommended by the specialists on the BA Team (for the 2016 - 2017 BA Processes), in consultation with Mainstream, taking into consideration the constraints on site in terms of sensitive environmental and topographical features.
- Option D - This routing option was recommended by Mainstream based on environmental sensitivities, landowner willingness and feasibility from a construction point of view.
- Option E - The section of the routing extending from the proposed collector hub on the Remaining Extent of Hartebeeste Fontein Farm 147 in the Northern Cape, has been assessed as part of the separate Moyeng Energy (PTY) Ltd Suurplaat WEF EIA, which received EA on 5 April 2011 (DEA Reference Number: 12/12/20/1583). It was referred to as Alternative C in the Moyeng Energy (PTY) Ltd Suurplaat WEF EIA and it was selected as the preferred alternative due to its short length. Therefore, this section of the power line routing was not considered by the specialists on this BA Team.

Options A to D, and the section of Option E that extends from the proposed Sutherland on-site substation to the proposed collector hub, as noted above, were considered by the specialists on the 2016 - 2017 BA Team. Option E (specifically the section that extends from the proposed collector hub to the proposed Eskom Nuwerust Substation) was assessed as part of the separate Suurplaat WEF EIA (DEA Reference Number: 12/12/20/1583), and was therefore not considered in this BA project. It is shown in Figure 15B above that all routing options (A to E) for Alternative 2 follow a common route up until a certain point on the Remaining Extent of Hartebeeste Fontein Farm 147 in the Northern Cape, and from this point, it splits into five separate route options.

Option A was determined by the specialists (as part of the 2016 - 2017 BA Processes) as the preferred power line routing option for Alternative 2, and it is referred to as "Alternative 2 - Distribution Line Routing and Connection to the Proposed Eskom Nuwerust Substation in the Western Cape".

It is important to reiterate that the proposed service roads will be constructed below the proposed power line and will therefore follow the same route as the proposed power line, except for a small section, where the service roads will follow an unused farm track to avoid the actual service roads being constructed across a scarp, which has terrestrial ecological value. Table 6 below provides a summary of the ranking and assessment of the different routing options that were considered for the proposed power line and service roads in the **previous BA reports for the proposed power line** (CSIR, 2017). Therefore, these alternative routing options have not been assessed again in this BA process, and the preferred routing option as determined by the specialists in the previous BA processes is deemed acceptable in this BA process.

Table 6: Summary of Ranking and Assessment of Routing Options that were previously considered for Alternative 2 of the Proposed Distribution Line and Service Road during the previous BA Process

Distribution Line Routing Options assessed in previous BAs	Specialist Assessment Feedback
<ul style="list-style-type: none"> ▪ Option A 	<p><u>Terrestrial Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ The topography along the power line routing Option A is quite mild compared to Options B, C and D, and the vegetation is sparse. There are some ephemeral features but these can be generally avoided. The sensitive scarp will not be crossed by the proposed service roads associated with Option A, and the scarp is crossed by the proposed electrical infrastructure as a result of Option B and D. Overall, Option A is preferred from a terrestrial ecology perspective. <p>Note: This is the routing that is currently included in this BA process.</p> <p><u>Aquatic Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ From a watercourse perspective, the horizontal (i.e. west to east) alignment of the power line routing, both Options A and D traverse ephemeral drainage lines, and mitigation will therefore be applicable regardless. However, the vertical (i.e. north to south) alignment of Option A of the power line routing results in fewer drainage line crossings than both Options C and D. Overall, therefore, Option A is preferred from water course perspective. <p><u>Archaeology Specialist:</u></p> <ul style="list-style-type: none"> ▪ Option A of the power line routing avoids scarps and large rivers, maximises road access in the south, provides a wider buffer for the farm complexes at Rheebockenfontein Farm 4 and it minimises bends (which is costly from a construction perspective), with careful placement of corners. The major scarp towards the north minimises the amount of routing flexibility. However, considering that the proposed service roads will cause greater impacts to the scarp (if traversed) than the proposed power line, it is recommended to align the service roads along an unused farm road that borders the scarp. This makes use of the existing roads and avoids the service roads from traversing the scarp. Overall, Option A is preferred from an archaeology perspective. <p><u>Palaeontology Specialist:</u></p> <ul style="list-style-type: none"> ▪ There are no preferences on palaeontological heritage grounds for any particular power line routing options under consideration. <p><u>Visual Specialist:</u></p> <ul style="list-style-type: none"> ▪ Distribution line routing Option A is better than routing Option C as it avoids the homestead at Farm Hamelkraal 16 and it seems to be better than routing Option D because it aligns with the road at a section where there are many power lines already in view (i.e. lower visual intrusion). There are very few visual receptors in the area so the differences between these alternatives are minimal. Therefore, in order of preference based on visual considerations: Routing Option A, Option D and Option C. <p><u>Therefore, based on the above feedback from the Terrestrial Ecology, Aquatic Ecology, Archaeology, Palaeontology and Visual Specialists, Option A of the power line routing is preferred over Options B, C, D and E.</u></p>
<ul style="list-style-type: none"> ▪ Option B 	<ul style="list-style-type: none"> ▪ As noted above, this option was included in the Background Information Document as Alternative 2 of the power line routing to the Eskom Nuwerust Substation. However, based on further discussions and interactions between Mainstream and certain landowners along this routing option, it is now evident that Option B of the power line routing is <u>no longer feasible or preferred from a technical and economic perspective (as well as landowner willingness).</u>

Distribution Line Routing Options assessed in previous BAs	Specialist Assessment Feedback
<ul style="list-style-type: none"> ▪ Option C 	<p><u>Terrestrial Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ The Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report)¹ recommends that steep scarps are avoided as they have a high ecological significance due to topographic variation. The specialist study also explains that topographic features, such as scarps should be given specific consideration, primarily on account of the fact that these areas offer significant faunal refugia. Option C avoids most of the steep scarps and is largely aligned with an existing road way. However, this could result in additional towers. <p><u>Aquatic Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ From a watercourse perspective, the vertical (i.e. north to south) alignment of Option C of the power line routing traverses more drainage lines than Option A. <p><u>Archaeology Specialist:</u></p> <ul style="list-style-type: none"> ▪ Distribution line routing Option C requires more refinement and crosses a watercourse twice, as well as traverses through and close to significant heritage features (i.e. farm complexes on Farm De Molen 5), which should be avoided. <p><u>Palaeontology Specialist:</u></p> <ul style="list-style-type: none"> ▪ There are no preferences on palaeontological heritage grounds for any particular power line routing options under consideration. <p><u>Visual Specialist:</u></p> <ul style="list-style-type: none"> ▪ Distribution line routing Option C passes within 200 m of the Hamelkraal Farm 16 farmstead. The existing views (of the occupiers of the farmstead) to the west and south will therefore be affected more by routing Option C than routing Option D. These views include relatively scenic views of the mountains which the occupiers of the farmstead may value. There are very few visual receptors in the area so the differences between these alternatives are minimal. Therefore, in order of preference based on visual considerations: Routing Option A, Option D and Option C. <p><u>Therefore, based on the above feedback from the Terrestrial Ecology, Aquatic Ecology, Archaeology, Palaeontology and Visual Specialists, Option C of the power line routing is not preferred.</u></p>
<ul style="list-style-type: none"> ▪ Option D 	<p><u>Terrestrial Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ The Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report) recommends that steep scarps are avoided as they have a high ecological significance due to topographic variation. The specialist study also explains that topographic features, such as scarps should be given specific consideration, primarily on account of the fact that these areas offer significant faunal refugia. Option D does not avoid most of the steep scarps. <p><u>Aquatic Ecology Specialist:</u></p> <ul style="list-style-type: none"> ▪ From a watercourse perspective, the horizontal (i.e. west to east) alignment of the power line routing, both Options A and D traverse ephemeral drainage lines, and mitigation will therefore be applicable regardless. However, the vertical (i.e. north to south) alignment of Option D of the power line routing results in more drainage line crossings than both Option A. <p><u>Archaeology Specialist:</u></p> <ul style="list-style-type: none"> ▪ Distribution line routing Option D traverses through and close to significant heritage

¹ Please note that the Terrestrial Ecology Impact Assessment included in Appendix D.1 referred to here, refers to the assessment included in the original BA report for the Sutherland WEF undertaken for the power line routing (CSIR, 2017).

Distribution Line Routing Options assessed in previous BAs	Specialist Assessment Feedback
	<p>features (i.e. farm complexes on Farm De Molen 5), which should be avoided.</p> <p><u>Palaeontology Specialist:</u></p> <ul style="list-style-type: none"> ▪ There are no preferences on palaeontological heritage grounds for any particular power line routing options under consideration. <p><u>Visual Specialist:</u></p> <ul style="list-style-type: none"> ▪ The routing Option D is marginally better than Option C mainly because Option D does not pass within 200 m of the Hamelkraal Farm 16 farmstead. There are very few visual receptors in the area so the differences between these alternatives are minimal. Therefore, in order of preference based on visual considerations: Routing Option A, Option D and Option C. <p><u>Therefore, based on the above feedback from the Terrestrial Ecology, Aquatic Ecology, Archaeology, Palaeontology and Visual Specialists, Option D of the power line routing is not preferred.</u></p>
<ul style="list-style-type: none"> ▪ Option E 	<ul style="list-style-type: none"> ▪ Mainstream has initiated discussions with Moyeng Energy (PTY) Ltd, who is the applicant for the proposed Suurplaat WEF. Moyeng Energy (PTY) Ltd confirmed that this <u>routing option (i.e. Option E) to the Eskom Nuwerust Substation is no longer feasible or preferred from a technical and economic perspective.</u> Option E was therefore not considered or assessed as part of this BA process.

Therefore, the specialists of the 2016 - 2017 BA Processes considered Options A to D of the power line routing from the proposed on-site substation to the proposed Eskom Nuwerust Substation (i.e. Alternative 2) as part of the previous assessments undertaken for the initial BAs. Based on sensitivities identified with each option of the power line routing and the possible impacts, the preferred routing option for Alternative 2 has been determined as Option A. This is the power line routing option that is currently assessed in this BA process, with amendments.

8.2. Type of Activity Alternatives

In terms of the alternatives considered for the type of activity to be undertaken, this is also entirely dependent on the activity associated with the proposed WEFs (where the activity associated with the WEFs is generation of electricity). Essentially, the proposed WEFs govern the type of activity associated with the proposed project. The activity to be undertaken is therefore the transmission of electricity that will be generated by the proposed WEFs. Therefore, as a result, alternatives for the type of activity for this proposed BA project are **not applicable**. The only feasible method of transmitting the electricity that is generated by the proposed WEFs to the MTS is via an overhead power line. Underground cabling is not deemed technically feasible as the voltage is considered to be too high. It is also important to note that the implementation of the WEFs at the proposed project sites was determined to be more favourable and feasible than other alternative energy facilities (such as Biomass, Hydro Energy and Solar Energy) for generating 20 MW or more of electricity from a renewable resource. Based on the preliminary investigations undertaken by Mainstream, no other renewable energy technologies were deemed to be appropriate for the sites.

8.3. Design or Layout of the Activity Alternatives

The Rochdale Envelope Approach² was applied to determine the placement of the proposed MTS, O&M building and laydown area within the development envelope, during the detailed engineering phase. The Rochdale Envelope approach is named after two legal cases relating to a proposed business park in Rochdale in the United Kingdom. These cases considered applications for outline

² Infrastructure Planning Commission (IPC), Using the 'Rochdale Envelope'. February 2011

planning consent in the context of preparing an EIA. The goal of the Rochdale Envelope approach is to allow for an EIA to be undertaken, based on the “worst case scenario”, whereby the Competent Authority granting the EA will then decide whether, based on this “worst case scenario”, the environmental impacts are acceptable.

This approach is very useful since normally an EIA or BA is undertaken prior to the technical assessment of the site which would consider the exact placement of, for example, the wind turbines and associated infrastructure. The main principle behind this approach is that, should the development fall within the parameters set within this “envelope”, as determined by the BA process, the placement of the different components could be determined at a later stage provided that the components fall within the parameters of the envelope. This approach therefore allows for flexibility to the developer during the detailed design phase in terms of engineering, design and construction parameters.

As discussed above, as part of the BA, a development envelope was considered and assessed by the specialists in order to ensure that any development constraints or environmental sensitivities can be avoided in the final siting and location of the proposed MTS, O&M building and laydown area, which can only be undertaken during the detailed engineering phase (as noted above). Based on the findings of the specialist studies, an environmental sensitivity map has been produced (and included in Appendix A.4 of this BA Report, as well as the EMPr included in Appendix F of this BA Report). The environmental sensitivities are also shown in Section A (5) of this BA Report.

It is important to note that should the preferred location change subsequent to the issuing of an EA (should such authorisation be granted), any alternative layout or revisions thereto within the boundaries of the development envelope would not be regarded as a change to the scope of work or to the findings of the impact assessments undertaken during the BA Phase. This is based on the understanding that the specialists have assessed the larger area and have identified sensitivities, which will be avoided in the siting of the proposed infrastructure. The development envelope is considered to be a “box” in which the project components can be constructed at whichever location (within its boundaries) without requiring an additional assessment or change in impact significance. Any changes to the layout within the boundaries of the development envelope following the issuing of the EA (should it be granted), will therefore be considered to be non-substantive, however this will need to be confirmed with the Competent Authority at the time. However, if any changes to the layout occur outside of the boundaries of the development envelope following the issuing of the EA (should it be granted), it will need to be undertaken as part of a separate EA Amendment process and will be considered as substantive. This approach will be confirmed with the competent authority when potential amendments will be considered.

8.4. Technology Alternatives

The technology that is proposed for the construction and operation of the proposed power line and electrical infrastructure will be guided by national standards and best practice. The technology options and operational aspects are also governed by Eskom’s requirements and building specifications. This therefore limits the amount of variability in terms of the technology and operational processes. The type of technology used will relate to the infrastructure being installed and constructed, such as the type of conductors, pylon structures and design, use of Bird Flight Diverters, and building structures for the MTS and O&M building. Other technology options for this project relate to the construction equipment and vehicles used during the construction phase, such as portable fire-fighting equipment (if necessary), stormwater management and spill contingency.

8.5. Alternatives: Operational Aspects of the Activity

It should be noted that no other alternatives are being considered for the proposed project. Refer to the explanations provided above regarding the alternative process.

8.6. No-go Option

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of **not constructing the proposed Electrical Grid Infrastructure BA project**. This alternative would result in no environmental impacts on the site or surrounding local area (as identified in Section D of this BA Report). It provides the baseline against which other alternatives are compared and considered throughout the report.

The following implications will occur if the “no-go” alternative is implemented (i.e. if the proposed project is not constructed):

- There will be negative implications for the proposed WEFs, as there will be no dedicated and fundamental electrical infrastructure to allow the proposed WEFs to connect to the MTS and the national grid. This could possibly result in non-realisation of the benefits, such as economic spin offs and electricity generation associated with the proposed WEFs. This could also result in additional costs and expenditure, as well as additional timeframes required, due to the potential re-design of the proposed WEFs to align with an alternative third-party substation within the region. Using an alternative third-party substation within the region (dependent on capacity requirements) could result in longer power lines and associated service roads, which could, in turn, cause additional negative impacts to the surrounding environment. If re-design is not financially and technically feasible, then the proposed WEFs will not be able to be constructed as it will not have fundamental infrastructure to link it to the national grid. If the proposed WEFs cannot be constructed as a result of the no-go of the proposed Electrical Grid Infrastructure BA project, this could, in turn, result in the following implications:
 - The landowners of the various farm portions on which the proposed infrastructure will be constructed will not be able to derive benefits from the implementation of an additional land-use;
 - No additional power will be generated or supplied through means of renewable energy resources by this project at this location;
 - There will be no contributions and assistance to the government in achieving its proposed renewable energy target of 17 800 MW by 2030;
 - No additional power will be provided via the Eskom grid, with approximately 90% coal-based power generation with associated high levels of CO₂ emissions and water consumption;
 - Electricity generation will remain constant (i.e. no additional renewable energy generation will occur on the proposed sites) and the local economy will not be diversified;
 - Local communities will continue their dependence on agriculture production and government subsidies. The local municipality’s vulnerability to economic downturns will increase because of limited access to capital;
 - The positive socio-economic impacts likely to result from the project such as increased local spending, skills transfer and education/training of local communities, and the creation of local employment opportunities will not be realised; and
 - The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realised.

Converse to the above, the following benefits could occur if the “no-go” alternative is implemented:

- There will be no development of electrical infrastructure that is associated with the WEFs at the proposed locations;
- The agricultural land use will remain as the only land use on site;
- No threatened vegetation will be removed or disturbed during the development of the electrical infrastructure;
- No potential impact to avifauna present in the area;

- No potential impact to heritage resources in the area;
- No change to the current landscape will occur; and
- No additional water use and waste generation during the construction phase.

It is important to take into account that the country is facing serious power and water shortages due to its heavy dependency on fossil fuels such as coal. There is therefore a need for additional electricity generation options to be developed throughout the country. The purpose of the proposed Electrical Grid Infrastructure BA Project is to transmit electricity generated by a renewable energy resource into the national electricity grid. Many other socio-economic and environmental benefits will result from the development of this project such as development of renewable energy resources in the country and contribution to the increase of energy security, employment creation and local economic development (as noted above). The impact assessment undertaken and discussed within Section D of this BA Report, shows that no significant residual impacts or risks (high significant impacts), would occur following the implementation of the required mitigation measures.

Hence, the “no-go” alternative will result in both positive and negative implications, by not proceeding with the project. In addition, by not constructing the proposed Electrical Grid Infrastructure, any positive community development or socio-economic benefits associated with the WEFs would not be realised. Since the WEFs have already received EAs in August 2017 following a second amendment process, it is deemed that the impacts associated with the proposed WEFs are acceptable in ensuring environmental sustainability and ecological functioning. Hence the “no-go” alternative is not a preferred alternative.

8.7. Concluding Statement for Alternatives

Appendix 1 of the 2014 NEMA EIA Regulations (as amended) has certain requirements in terms of alternatives. Table 7 below indicates these requirements and also includes a response from the EAP showing how the requirements of the 2014 NEMA EIA Regulations (as amended) have been addressed in this report.

Table 7: Requirements of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) in terms of Alternatives

Requirements for a BA Report (in terms of alternatives) in terms of Appendix 1 of the 2014 NEMA EIA Regulations (as amended)	Response from EAP
Regulation 3 (1) (h): A full description of the process followed to reach the proposed preferred alternative within the site, including: <ul style="list-style-type: none"> ▪ (i) details of all the alternatives considered; 	Refer to Section A (8) i.e. this section of the BA Report for a description of the alternatives considered, and a justification for the inapplicability of certain alternatives.
<ul style="list-style-type: none"> ▪ (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; 	Refer to Section C of this BA Report for a description of the PPP undertaken.
<ul style="list-style-type: none"> ▪ (iii) a summary of the issues raised by interested and affected parties (I&APs), and an indication of the manner in which the issues were incorporated, or the reasons for not including them; 	The Draft BA Report will be released to I&APs for a 30-day commenting period. All comments that will be received will be included in Section C and Appendix E of the Final BA Report.
<ul style="list-style-type: none"> ▪ (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; 	Refer to Section A (8) i.e. this section of the BA Report for a description of the alternatives considered and their corresponding environmental attributes. Site alternatives are not applicable as the location of the proposed Electrical Grid Infrastructure is dependent on the location of the proposed WEFs, landowner willingness, feasibility and environmental sensitivity.

	<p>However, five routing options of the proposed power line to the proposed Eskom Nuwerust Substation (for Alternative 2) have been considered previously in the initial BA processes, as described above. Sections A (5), A (8) and Section B of this BA Report, as well as the specialist studies included in Appendix D provide a description of the affected environment.</p>
<ul style="list-style-type: none"> ▪ (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; 	<p>Refer to Section A (8) i.e. this section of the BA Report for a description of the alternatives considered, and a justification for the inapplicability of certain alternatives. Note that a complete impact assessment is included in Section D of this BA Report. Section D of this BA Report details the impacts and risks identified and includes the complete impact assessment (which is also included in the respective specialist studies in Appendix D of this BA Report). This includes the nature, significance, consequence, extent, duration, probability, reversibility, and irreplaceability of the impacts. The methodology used in the impact assessment is also noted in Section D of this report.</p>
<ul style="list-style-type: none"> ▪ (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; 	<p>As noted above, site alternatives are not applicable as the location of the proposed Electrical Grid Infrastructure is dependent on the location of the proposed WEFs, landowner willingness, feasibility and environmental sensitivity. However, five routing options of the proposed power line to the Eskom Nuwerust Substation (for Alternative 2) have been considered in the previous assessments undertaken in the initial BA, as described above, in order to determine the best Alternative 2 routing. In addition, both Alternatives 1 and 2 of the proposed power line routing have been assessed as part of initial BA processes, based on the precautionary principle to allow for the WEFs to connect to either Alternative 1 or Alternative 2 of the third-party substation, should either one not be constructed. During the initial BA processes undertaken, Alternative 1 was selected as the preferred power line routing option, however both Alternative 1 and Alternative 2 were considered feasible, acceptable and did not display any environmental fatal flaws. EA for the previously assessed Alternative 2 power line routing from the proposed Sutherland on-site substation, to the proposed MTS and the proposed 4 km long 400 kV power line to an existing Eskom power line is now being sought. The main reason for this is that the approved power line Alternative 1 routing is dependent on third-parties receiving EA and preferred bidding status. In addition, the proposed third-party Suurplaat Substation has not been constructed yet, and the third-party Applicant has not been able to sure land control for this connection yet. Therefore, to ensure more stability, Mainstream has therefore commissioned this BA Process to ensure that the proposed Sutherland, Sutherland 2 and Rietrug WEFs are able to connect to the National Grid in a stable manner that is not dependent on third-parties. This was discussed in detail with the DEFF during the pre-application meeting that took place in May 2019. Appendix I.2 of this BA Report includes the agenda, minutes and signed attendance register of the pre-application meeting.</p>
<ul style="list-style-type: none"> ▪ (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; 	
<ul style="list-style-type: none"> ▪ (viii) the possible mitigation measures that could be applied and level of residual risk; 	
<ul style="list-style-type: none"> ▪ (ix) the outcome of the site selection matrix; 	
<ul style="list-style-type: none"> ▪ (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and 	

	<p>Where applicable, the specialists assessed the worst case by studying a larger buffer and investigation area, whilst the proposed Electrical Grid Infrastructure will only be constructed within a portion thereof. Essentially, the sensitivities identified by the specialists within the buffer and investigation area have enabled the determination of the preferred routing of the power line by way of avoidance.</p>
<ul style="list-style-type: none"> ▪ (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity. 	<p>Based on the aspects considered in this section, the following concluding statement has been provided in terms of the preferred alternatives that have been considered in the BA Phase:</p> <ul style="list-style-type: none"> ▪ Development of the Electrical Grid Infrastructure project, using various technological alternatives relating to the design and construction of the pylon structures on the following preferred sites for the proposed power line (Remaining Extent of Beeren Valley Farm 150; Remaining Extent of Nooitgedacht Farm 148; Remaining Extent of Hartebeeste Fontein Farm 147; Portion 1 of Farm 219; Remaining Extent of Farm 219; Remaining Extent of Farm 280; Portion 1 of Rheebokkenfontein Farm 4; Portion 2 of Rheebokkenfontein Farm 4; Portion 2 of Farm De Molen 5; Portion 6 of Farm Hamelkraal 16; Portion 7 of Farm Hamelkraal 16 and Remaining Extent of Spitskop Farm 20) is <u>mainly</u> dependent on the location of the proposed WEFs. The routing of the proposed 132 kV and 400 KV power lines, the layout of the proposed power line, MTS, O&M building, laydown area, and service roads have been informed by specialist studies undertaken during the BA process to avoid environmental sensitivities as far as possible, as well as feasibility and landowner willingness (refer to Appendix D of this report for the specialist studies).

9. NEEDS AND DESIRABILITY

It is an important requirement in the BA process to review the need and desirability of the proposed project. Draft guidelines on Need and Desirability were published in the Government Gazette of 5 October 2012, for comment. These draft guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. In addition, the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) also published a Guideline on Need and Desirability in 2010. The DEA&DP Guideline (2010) states that the essential aim of investigating the need and desirability of a proposed project revolves around determining suitability (i.e. is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity?). DEA&DP describes need and desirability as components of the “wise use of land”, where need refers to time, and desirability to place. In other words, need and desirability answer the question of whether the activity is being proposed at the right time and in the right place.

Table 8 below includes a combination of questions based on the DEA&DP 2010 Guideline, as well as recommendations of the DEFF, to determine the need and desirability of the proposed project.

Table 8: List of Questions to determine the Need and Desirability of the Proposed Project

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO ✓														
As noted above, the proposed power line will traverse the following farm portions located in the Northern and Western Cape:																
<table border="1"> <thead> <tr> <th>Northern Cape Farm Portions</th> </tr> </thead> <tbody> <tr> <td>Remaining Extent of Beeren Valley Farm 150</td> </tr> <tr> <td>Remaining Extent of Nooitgedacht Farm 148</td> </tr> <tr> <td>Remaining Extent of Hartebeeste Fontein Farm 147</td> </tr> <tr> <td>Portion 1 of Farm 219</td> </tr> <tr> <td>Remaining Extent of Farm 219</td> </tr> <tr> <th>Western Cape Farm Portions</th> </tr> <tr> <td>Remaining Extent of Farm 280</td> </tr> <tr> <td>Portion 1 of Rheebokkenfontein Farm 4</td> </tr> <tr> <td>Portion 2 of Rheebokkenfontein Farm 4</td> </tr> <tr> <td>Portion 2 of De Molen Farm 5</td> </tr> <tr> <td>Portion 6 of Hamelkraal Farm 16</td> </tr> <tr> <td>Portion 7 of Hamelkraal Farm 16</td> </tr> <tr> <td>Remaining Extent of Spitskop Farm 20</td> </tr> </tbody> </table>			Northern Cape Farm Portions	Remaining Extent of Beeren Valley Farm 150	Remaining Extent of Nooitgedacht Farm 148	Remaining Extent of Hartebeeste Fontein Farm 147	Portion 1 of Farm 219	Remaining Extent of Farm 219	Western Cape Farm Portions	Remaining Extent of Farm 280	Portion 1 of Rheebokkenfontein Farm 4	Portion 2 of Rheebokkenfontein Farm 4	Portion 2 of De Molen Farm 5	Portion 6 of Hamelkraal Farm 16	Portion 7 of Hamelkraal Farm 16	Remaining Extent of Spitskop Farm 20
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Portion 2 of De Molen Farm 5																
Portion 6 of Hamelkraal Farm 16																
Portion 7 of Hamelkraal Farm 16																
Remaining Extent of Spitskop Farm 20																
According to the Agriculture Impact Assessment (Appendix D.6) the proposed project will be located on land zoned and used for agriculture (grazing). South Africa has very limited arable land and it is therefore critical to ensure that development does not lead to an inappropriate loss of land that may be valuable for cultivation. This assessment has found that the proposed development is on land which is of extremely low agricultural potential and is totally unsuitable for cultivation. Furthermore, the agricultural impact of grid infrastructure in this environment is negligible. The overall significance of the impact on agriculture for the construction, operation and decommissioning phase is assessed as very low.																
The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of this BA Report) explains that the farms in the study area have been subjected to grazing for a significant period of time, predominantly by sheep, resulting in altered vegetation communities; although, vegetation within the watercourses is considered to be denser, and was observed to have marginally higher species diversity than the surrounding terrestrial areas.																
In addition, due to the limited development footprint of the proposed Electrical Grid Infrastructure in comparison to the large extent of the affected farms, it is not expected that this will threaten the agricultural activities present on site. Therefore, should the proposed project proceed, it is not expected that this will threaten the land use rights of the affected properties.																
2. Will the activity be in line with the following?																
(a) Provincial Spatial Development Framework (PSDF)	YES ✓	NO														
As noted above, the proposed power line routing and MTS connection occurs in the Northern Cape and the Western Cape.																
The Northern Cape PSDF states that one of the energy objectives is to promote renewable energy, which is considered to be a priority in the province (Northern Cape Government, 2012). Poverty levels and levels of unemployment are also a major concern, as noted in the Northern Cape PSDF (Northern Cape Government, 2012). The Western Cape PSDF states that one of the provincial spatial policies is to support emergent IPPs and promote renewable energy (Western Cape Government, 2014). The Western Cape PSDF (Western Cape Government, 2014, pg. 23) also lists the following spatial challenges within the province: lack of jobs and skills; education and poverty; inequality and social unrest; and unsustainable settlement patterns and resource use.																
In line with the above, the revised Integrated Development Plan (IDP) 2016 - 2017 of the Namakwa District Municipality (Northern Cape Government, 2016a), states that some of the main challenges within the municipality are unemployment, ineffective economic infrastructure, and poor public services. The IDP (2016 - 2017) states that the objective to resolve this issue is to create empowerment through job creation, improving education, capacity building and skills development. The 2012 - 2017 IDP of the Central Karoo District Municipality (Western Cape Government, 2012) includes similar challenges and objectives as that of the Northern Cape.																

Even though the proposed WEFs (which have been subjected to separate EIA Processes, as noted above) will not provide electricity to the municipality directly, the energy produced by the facilities will feed into the national grid as a result of this proposed Electrical Grid Infrastructure project. In addition, on a local level, the proposed project will contribute towards job creation and economic spin offs during the construction phase (if an EA is granted by the DEA). It is estimated that approximately 130 employment opportunities will be created during the construction phase. It should however be noted that employment during the construction phase will be temporary. The proposed project will also play a role in providing advanced skills transfer and training to the local communities during the construction phase, as applicable.

The DEA commissioned a SEA for Electrical Grid Infrastructure to assist Eskom with identifying priority corridors and to improve environmental regulatory processes inside the corridors in support of Strategic Infrastructure Project (SIP) 10. The final Power Corridors assessed as part of the 2016 Electricity Grid Infrastructure SEA were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 113. The Gazette documented notice given by the Minister of Environmental Affairs of alternative procedures to be followed when applying for EA for large scale electricity transmission and distribution development activities, identified in terms of section 24(2)(a) of the NEMA in the identified Strategic Transmission Corridors (i.e. areas declared as geographical areas of strategic importance). The proposed Electrical Grid Infrastructure project falls within the Central Power Corridor included in the Electrical Grid Infrastructure SEA (Figure 16).

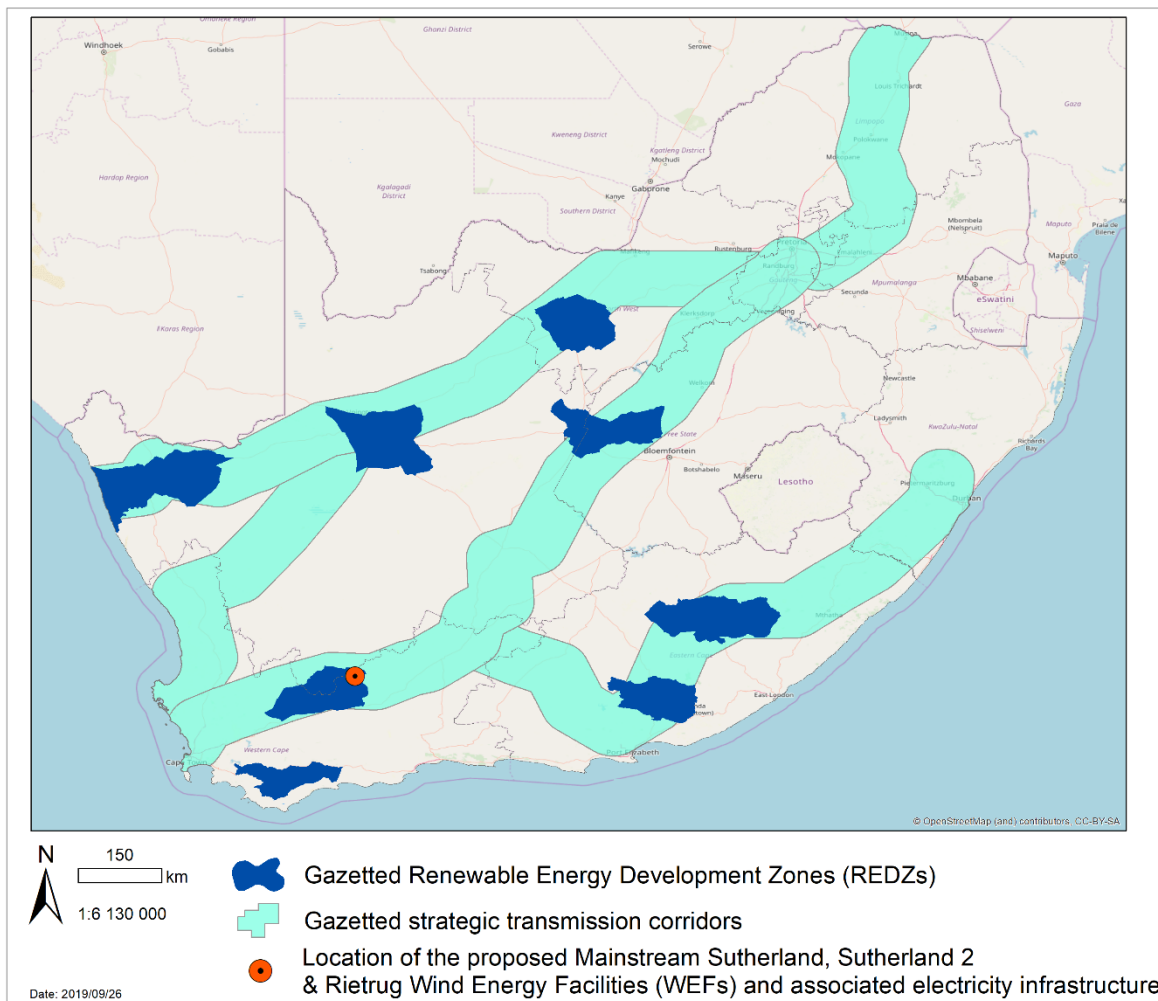


Figure 16: Gazetted power corridors as identified in the Electrical Grid Infrastructure SEA (CSIR, 2016)

In addition, in 2013 the National DEA commissioned the SEA for Wind and Solar PV development (Phase 1), which aims to identify strategic geographical areas best suited for the roll-out of large scale wind and solar PV energy projects, referred to as Renewable Energy Development Zones (REDZs). Eight REDZs have been identified and assessed in the SEA, namely: REDZ 1: Overberg; REDZ 2: Komsberg; REDZ 3: Cookhouse; REDZ

4: Stormberg; REDZ 5: Kimberley; REDZ 6: Vryburg; REDZ 7: Upington; and REDZ 8: Springbok (CSIR, 2015). The proposed Electrical Grid Infrastructure project, which will fundamentally support the proposed WEFs, falls within REDZ 2: Komsberg, as shown in Figure 17 below. The eight REDZs were gazetted for implementation on 16 February 2018 in Government Gazette 41445, Government Notice 114. The Gazette documented notice given by the Minister of Environmental Affairs of procedures to be followed when applying for EA for large scale wind and solar photovoltaic energy development activities, identified in terms of section 24(2)(a) of the NEMA.

The proposed project is therefore aligned with national planning priorities. On a local and provincial level, the implementation of the proposed project will contribute to the objectives of the PSDF and IDP through the distribution of electricity to be generated through renewable sources; the creation of employment opportunities during the construction phase of the development and local socio-economic development.

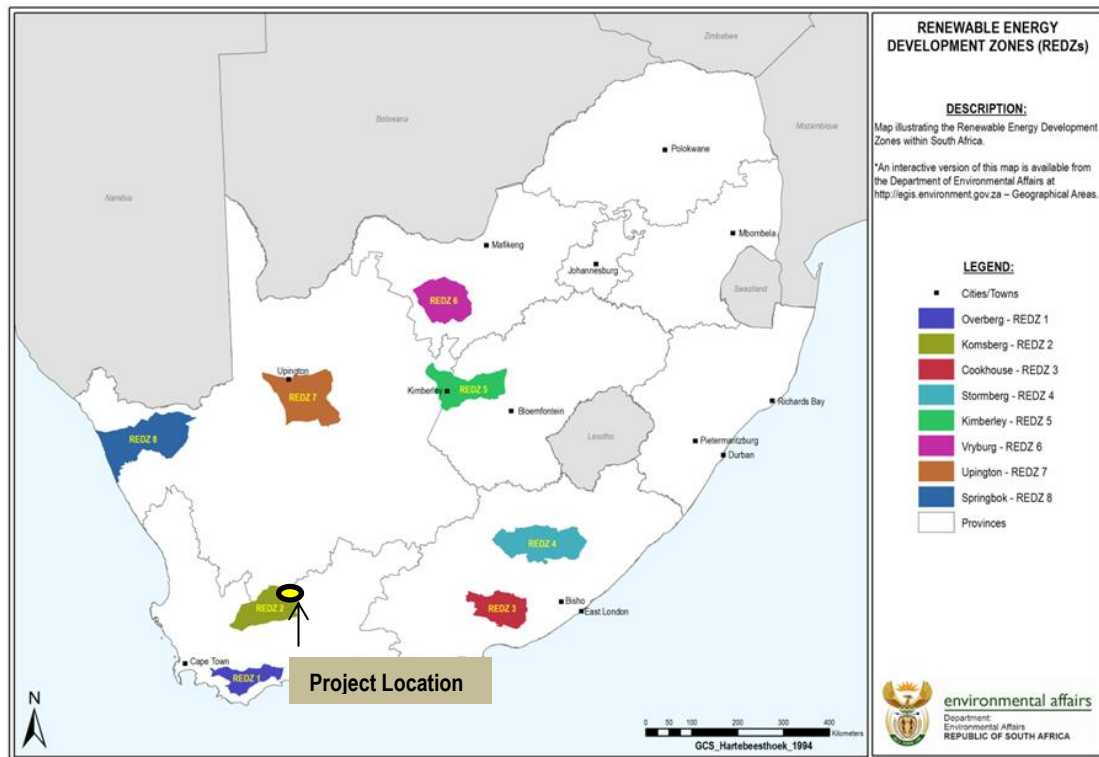


Figure 17: REDZs identified in the SEA (Phase 1(REDZ 1: Overberg; REDZ 2: Komsberg; REDZ 3: Cookhouse; REDZ 4: Stormberg; REDZ5: Kimberley; REDZ 6: Vryburg; REDZ 7: and Upington; REDZ 8: Springbok) (CSIR, 2015). The proposed project falls within the REDZ 2: Komsberg.

(b) Urban edge / Edge of Built environment for the area	YES	NO ✓
As noted above, the proposed project falls approximately 23 km south of Sutherland and 50 km north of Laingsburg within the Karoo Hoogland Local Municipality (Northern Cape Province) and Laingsburg Local Municipality (Western Cape Province). The proposed project falls within a rural, natural landscape and outside the urban edge.		
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES ✓	NO
The proposed activity does not compromise any of the objectives set within the Laingsburg Local Municipality IDP (2012 - 2017, Page 74) (Laingsburg Local Municipality, 2012), which states that one of the objectives for economic development is to create employment opportunities and alleviate poverty in order to achieve community empowerment. Promoting renewable energy and infrastructure development is listed a strategy within the Laingsburg Local Municipality IDP (2012 - 2017) (Laingsburg Local Municipality, 2012).		

<p>In addition, the Karoo Hoogland Local Municipality revised IDP (2016 - 2017), approved in 2016 (Karoo Hoogland Local Municipality, 2016), states that the vision for the municipality is to be an economical growth node in the Northern Cape, in an environment that will enhance economic development by focusing on poverty alleviation and the creation of job opportunities.</p> <p>Therefore, the proposed project will be supportive of the IDP's objective of creating more job opportunities and promoting renewable energy. The proposed project will also create economic spin offs during the construction phase (if an EA is granted by the DEA). It is estimated that approximately 130 employment opportunities will be created during the construction phase. As previously stated, the proposed project will also provide fundamental infrastructure to ensure that the proposed WEFs are able to operate and transmit the electricity that it will generate. Therefore, through the development of this project, the WEF can be developed which in turn, will lead to an increased opportunity for temporary and permanent jobs.</p>		
(d) Approved Structure Plan of the Municipality	YES ✓	NO
<p>It is not expected that the authorisation of the proposed project would compromise the integrity of the existing plans for the area. Furthermore, mitigation measures have been recommended as part of the BA process to manage potential negative environmental impacts that may occur during the construction, operational and potential decommissioning phases. To this end, an EMPr, which is included as Appendix F of this BA Report, has been compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced.</p> <p>Furthermore, the municipalities are aware of the approved WEFs and are also included on the I&AP database for this Electrical Grid Infrastructure project. The various municipalities will also be consulted with during the PPP, to ensure that any concerns and issues are recorded and addressed, where possible and applicable, in the BA process. This will play a role in ensuring that the objectives of the proposed project are aligned with the future plans and approved structure plan of the municipalities.</p>		
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES <i>Refer to the explanation below</i>	NO
<p>The Northern Cape PSDF (Northern Cape Government, 2012) states that the Provincial Environmental Management Framework (EMF) is listed as Sectoral Strategy 16 and it needs to be prepared and applied as part of the PSDF (once approved). The Northern Cape PSDF is to be facilitated by the Northern Cape Department of Environment and Nature Conservation (DENC).</p> <p>However, no EMF has been found for either the Namakwa District Municipality or the Central Karoo District Municipality. Nevertheless, it is not expected that the approval of the proposed project would compromise the integrity of the existing plans and environmental priorities for the area. Furthermore, mitigation measures have been recommended as part of the BA process to manage potential negative environmental impacts that may occur during the construction, operational and potential decommissioning phases. To this end, an EMPr, which is included as Appendix F of this BA Report, has been compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced.</p>		
(f) Any other Plans (e.g. Guide Plan)	YES <input type="checkbox"/> ✓	NO
<p>The Northern Cape Environmental Implementation Plan (EIP), Third Edition, 2015 - 2020, was compiled by the DENC and published under PN 173 on 20 November 2015. The EIP aims to regulate and co-ordinate environmental policies, plans and programmes within the Northern Cape, as well as to promote a sustainable environment. The proposed project is aligned with the EIP as it addresses environmental issues via the BA process and EMPr (Appendix F of this BA Report) implementation.</p>		
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES ✓	NO
<p>Even though the proposed WEFs (which have been subjected to separate EIA Processes, as noted above) will not provide electricity to the municipality directly, the energy produced by the facilities will feed into the national grid as a result of the proposed Electrical Grid Infrastructure project. The proposed project is also aligned with the gazetted REDZs identified as part of the SEA for Wind and Solar PV development (Phase 1) (CSIR, 2015) and the gazetted corridors identified in the SEA for Electrical Grid Infrastructure (CSIR, 2016). The proposed Electrical Grid Infrastructure project falls within REDZ 2: Komsberg and within the Central Power Corridor.</p>		

Overall, the implementation of the proposed project will contribute to the objectives of the Western Cape and Northern Cape PSDF and IDP through the distribution of electricity to be generated through renewable sources; the creation of employment opportunities during the construction and operational phases of the development and local socio-economic development.		
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES ✓	NO
As noted above, at a national level, the DOE has set the target of having 17 800 MW of electricity generated from Renewable Energy sources contributing to the national grid by 2030 to ensure the continued uninterrupted supply of electricity. As noted above, Mainstream intends to submit the approved WEFs (EAs issued on 10 November 2016, and currently undergoing substantive amendment) for the next round of the REIPPPP and this project can therefore contribute to the IPP goals and feed into the national grid, which results in this project having national importance. Furthermore, the proposed Electrical Grid Infrastructure project will ensure that the proposed and approved WEFs are viable for submission as part of the REIPPPP as it will ensure fundamental connection to the national grid. Should the proposed WEFs receive preferred bidder status, the social responsibility requirements in terms of the REIPPPP will be implemented and the positive impacts will therefore be realised.		
As stated above, the implementation of the proposed project will ensure and facilitate connection of the WEFs to the national grid, create employment opportunities during the construction and operational phases of the development, and enhance local socio-economic development.		
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	YES <i>Refer to the explanation below</i>	NO
Minimal existing municipal services for the handling of waste, provision of water and sewage handling are expected to be required for the proposed project. Where possible, the local municipalities will be contacted during the 30-day review of the BA Report in order to seek confirmation of the availability of the services. However, as noted previously, should the municipality not have adequate handling of waste, provision of water and sewage handling provisions available; then the applicant will make use of private contractors to ensure that the services are provided. The applicant will also ensure that adequate waste disposal measures are implemented, and waste disposal waybills will be obtained when waste is removed from site (in line with the EMPr (including in Appendix F of the BA Report)).		
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?	YES	NO ✓
There is no anticipated negative impact on municipal infrastructure planning (no clash of priority, and/or placement) as the proposed project will be developed by Mainstream, a private developer. In addition, any additional infrastructure required to maintain the proposed electrical infrastructure would be provided and maintained by the applicant or Eskom (as explained above). The activity is furthermore proposed on agricultural land with little or no existing and planned infrastructure. The opportunity cost of constructing the proposed project might increase the viability of agricultural productivity due to financial advantage (i.e. farmers will receive payments for lease of the property per quarter or year). The opportunity cost of not constructing the proposed electrical infrastructure to service the proposed Sutherland WEFs would be the maintenance of the current status quo, which is marginal agriculture and grazing.		
7. Is this project part of a national programme to address an issue of national concern or importance?	YES ✓	NO
The National Integrated Resource Plan for Electricity (IRP2) (2011) suggests that 42% of national energy supply must come from renewable energy sources between 2010 and 2030. Therefore, this project will provide the necessary infrastructure to fundamentally support the proposed WEFs, which is aligned with the government's plan to increase renewable energy sources.		
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES ✓	NO
The wind resource levels within the Sutherland area are good, which makes it a very favourable location for the approved WEFs (EA issued on 10 November 2016, and currently undergoing substantive amendments). As highlighted in Section A (8) of this BA Report, the location of the proposed Electrical Grid Infrastructure project is therefore highly dependent on the location of the proposed WEFs and the third-party substation. The location of the proposed Electrical Grid Infrastructure project is also dependent on cost effectiveness,		

feasibility, environmental sensitivities and landowner willingness. If the proposed WEFs cannot connect to the MTS, this could result in additional costs and expenditure, as well as additional timeframes required, as a result of the potential re-design of the WEFs to align with an alternative substation within the region. Using an alternative substation within the region (dependent on capacity requirements) could result in longer power lines and associated service roads. This could result in additional negative impacts to the surrounding environment. Due to the presence of other Eskom power lines and electrical infrastructure in the area the land use is favoured from an electrical landscape perspective.

Overall, the location of the proposed project is considered to be feasible and suitable based on the environmental and technical issues taken into consideration. Refer to Appendix D of this BA Report (which includes the various specialist studies) for a detailed description of the location of the study area.

9. Is the development the best practicable environmental option for this land/site?	YES ✓	NO
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Based on the findings of this BA, the proposed project would not have a significant (“high”) negative impact on the receiving environment, with the implementation of suitable mitigation measures. It is also important to point out that the proposed project will be designed according to relevant national specifications and standards which are regarded as best practice in the renewable energy sector. Therefore, the construction of the proposed project is the best practicable option for the land. In addition, the construction of the proposed electrical infrastructure (and ultimately the proposed WEFs) would have a positive socio-economic impact on the area. Overall, the location of the proposed project is considered to be feasible and suitable based on the environmental and technical issues taken into consideration. Refer to Appendix D of this BA Report (which includes the various specialist studies) for a detailed description of the location of the study area.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES ✓	NO
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Based on the findings of this BA, the proposed project would not have a significant (“high”) negative impact on the receiving environment, with the implementation of suitable mitigation measures. In addition, the construction of the proposed electrical infrastructure (and ultimately the proposed WEFs) would have a positive socio-economic impact on the area and it will align with the various provincial and national policies and plans (as described above). The proposed project will also facilitate connection of the authorised WEFs to the national grid. Therefore, the predicted benefits of the proposed development are expected to outweigh the negative impacts of it. None of the negative impacts are rated with a high significance with the implementation measures, and no fatal flaws have been identified by the specialists. Refer to Appendix D of this BA Report (which includes the various specialist studies) for a detailed impact assessment for the proposed project.

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES ✓	NO
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Various other renewable energy facilities and electrical power lines have been proposed in the immediate area. Various other WEFs and solar energy facilities are proposed within 50 km of the WEF, of which all would require supporting infrastructure. The main aspect that will lead to more projects being developed in the area is the presence of Eskom Substations that have available grid capacity that could evacuate the electricity generated from a renewable source into the national grid. The proposed project is located within one of the gazetted power line corridors (the central power corridor) and is therefore located in an area earmarked for the development of electrical infrastructure as per national planning objectives of the DoE and the DEFF.

12. Will any person’s rights be negatively affected by the proposed activity/ies?	YES	NO ✓
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No negative impacts of a high significance (with the implementation of mitigation measures) have been identified as part of the BA.

The impacts on health and wellbeing are expected to be minimal as the proposed project is taking place within a sparsely populated region. Dust may be generated during the construction phase; however, it is expected to be of a short-term duration and of low significance. However, where applicable, mitigation measures relating to potential impacts on the health and wellbeing of people (such as landowners, farm workers, and construction staff) have been included in the EMPr (Appendix F of the BA Report). Odours will be minimal during the construction phase and non-existent during the operational phase.

During the construction phase, noise may be generated as a result of the operation of equipment, vehicles and machinery, the transportation of construction materials and staff to and from site, the establishment of site construction areas, as well as general construction activities. However, the noise levels and impacts will be short-term and are not expected to be significant during the construction phase. During the operational

phase, the proposed power line will not generate any noise. Mitigation measures have been included in the EMPr (Appendix F of the BA Report) to reduce the negative noise impacts during the construction phase.

In terms of visual character and sense place, there are very few visual receptors in the area. Additional information is provided in the Visual Impact Assessment (Appendix D.3 of this BA Report).

Notwithstanding the above, the socio-economic benefits likely to result from the proposed project (e.g. capital via leasing of the land to Mainstream, creation of jobs and regional economic development) would most likely outweigh the issues mentioned above.

13. Will the proposed activity/ies compromise the “urban edge” as defined by the local municipality?	YES	NO ✓
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As noted above, the proposed project falls south of Sutherland and north of Laingsburg within the Karoo Hoogland Local Municipality (Northern Cape Province) and Laingsburg Local Municipality (Western Cape Province). The proposed project falls within a rural, natural landscape and outside the urban edge.

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES	NO ✓
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The proposed project itself is not part of any of the SIPS. However, the proposed project will directly support the objectives of SIP 8: Green energy in support of the South African economy (support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP) 2010).

The energy produced by the proposed WEFs (which have been subjected to separate EIA processes, as noted above) will feed into the national grid as a result of this proposed Electrical Grid Infrastructure project. In addition, on a local level, the proposed project will contribute towards job creation and economic spin offs during the construction phase (if an EA is granted by the DEFF). The proposed project will also play a role in providing advanced skills transfer and training to the local communities during the construction phase, as applicable.

In addition, the proposed project is aligned with the REDZ identified as part of the SEA for Wind and Solar PV development (Phase 1) (CSIR, 2015) and the corridors identified in the SEA for Electrical Grid Infrastructure (CSIR, 2016).

15. What will the benefits be to society in general and to the local communities?

The socio-economic benefits likely to result from the proposed project (e.g. creation of jobs and regional economic development) would most likely outweigh the minor issues noted above, such as dust generation, noise, impacts to the visual landscape, and odour emissions.

16. Any other need and desirability considerations related to the proposed activity?

The need and desirability considerations have been described above.

17. How does the project fit into the National Development Plan for 2030?

The National Development Plan (National Planning Commission, 2011, p.10) proposes to create 11 million jobs by 2030 by:

- “Realising an environment for sustainable employment and inclusive economic growth;
- Promoting employment in labour-absorbing industries;
- Raising exports and competitiveness;
- Strengthening government’s capacity to give leadership to economic development; and
- Mobilising all sectors of society around a national vision”.

Approval of this BA project will enable and facilitate the construction of a larger suite of WEF projects proposed by Mainstream, which will play a role in enhancing employment and economic growth objectives by creating employment opportunities and contributing to economic growth.

18. Describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

The general objectives of Integrated Environmental Management set out in Section 23 of the NEMA and how these objectives have been taken into account in this BA process is provided below.

Section 23 in NEMA:	How it has been addressed in this BA process:
(2) The general objective of integrated environmental management is to:	Discussed in Question 19 below.

(a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;	
(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;	Potential impacts on the environment, society, the economy and cultural heritage, occurring as a result of the proposed project, have been identified and assessed in Section D of this BA Report (as well as in Appendix D of this BA Report). Mitigation measures to minimise potential negative impacts and enhancement measures to maximise positive impacts have also been suggested in Section D of this BA Report, as well as Appendix F (EMPr).
(c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;	Assessing the potential impacts of the proposed project (as noted in Section D and Appendix D of this BA Report) warrants that all effects associated with the proposed project have received adequate consideration prior to any action relating to these activities being undertaken.
(d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;	Appropriate public participation has been undertaken for the proposed project, in compliance with the 2014 NEMA EIA Regulations (as amended). The PPP is described in Section C of this BA Report.
(e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and	The specialist studies undertaken as part of the BA process and included in Appendix D of this BA Report assisted in the identification and description of environmental attributes and significant environmental impacts, which are indicated and assessed in Section D of this BA Report as well. Mitigation measures have also been suggested in Section D of this BA Report, as well as Appendix F (EMPr).
(f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.	The EMPr (included in Appendix F of this BA Report) includes mitigation measures to minimise negative environmental impacts, as well as mitigation objectives and management.
19. Describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.	
<p>The principles of NEMA have been considered in this assessment through:</p> <ul style="list-style-type: none"> ▪ Compliance with the requirements of relevant legislation in undertaking the assessment of potential impacts; ▪ Implementation of the principle of sustainable development where appropriate mitigation measures have been recommended for impacts which cannot be avoided; ▪ Ensuring that the successful implementation and appropriate management of this project will aid in achieving the principle of minimisation of pollution and environmental degradation; ▪ Undertaking the BA process in an inclusive and transparent manner; and ▪ Making great efforts to involve I&APs, stakeholders and relevant Organs of State in the process such that an informed decision regarding the project can be made by the Competent Authority. 	

10. APPLICABLE LEGISLATION

The scope and content of this BA Report has been informed by *inter alia* the following legislation, guidelines and information series documents (Table 9). It is important to note that the specialist studies included in Appendix D of this BA Report also include a description of the relevant applicable legislation.

Table 9: Legislation Applicable to the Proposed Project

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
NEMA (Act 107 of 1998, as amended)	The proposed project will require the implementation of appropriate environmental management practices.	National DEA	19 November 1998
NEMA EIA Regulations published in GN R982, R983, R984 and R985, and as amended on 7 April 2017 in GN R326, R327, R325 and R324	These Regulations provide the procedures that need to be followed for the BA process.	National DEA	8 December 2014
NEMA EIA Regulations published in Government Notice R983 and R985, and as amended on 7 April 2017 in GN R327 and R324	These Regulations contain the relevant listed activities that are triggered, thus requiring a BA. Please refer to Section A (7) of this BA Report for the complete list of listed activities.	National DEA	8 December 2014 and amended on 7 April 2017
National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)	General and hazardous waste will be generated during the construction phase, which will require proper management.	National DEA	6 March 2009
National Environmental Management: Waste Amendment Act (Act 26 of 2014)	General and hazardous waste will be generated during the construction phase, which will require proper management.	National DEA	2 June 2014
National Environmental Management: Air Quality Act (Act 39 of 2004)	The proposed stockpiling activities, including earthworks, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be applied.	National DEA	19 February 2005
Water Services Act (Act 108 of 1997)	Water will be required during the construction and decommissioning phases of the proposed project, for consumption purposes, earthworks and grassing etc.	National Department of Water and Sanitation (DWS)	1997
Hazardous Substances Act (Act 15 of 1973)	During the proposed project, fuel and diesel will be utilised to power vehicles and equipment. In addition, potential spills of hazardous materials could occur during the construction and decommissioning phases.	Department of Health	1973
Environmental Conservation Act (ECA) (Act 73 of 1989 Amendment Notice No.1183 of 1997)	The ECA was promulgated prior to the NEMA, and was the main piece of legislation in dealing with environmental issues in South Africa. The ECA has largely been repealed and replaced with NEMA.	National DEA	1997
National Forests Act (Act 84 of 1998)	The National Forest Act (Act 84 of 1998) governs the removal, disturbance, cutting or damage and destruction of identified "protected trees". If any protected species are found on site during the search and rescue or construction phase, the Provincial Department of Agriculture, Forestry and Fisheries (DAFF) will be contacted to discuss the permitting requirements. It is not unlikely that any listed trees will be encountered during	DAFF	1998

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
	the construction of the proposed infrastructure, nor would the clearing of “natural forest”, as defined within the Act, be required on the site.		
National Water Act (NWA) (Act 36 of 1998)	<p>The need for a WUL will be confirmed with the DWS during the 30-day review of the BA Report. Consultation with the DWS will also ensure that the relevant legislative requirements are complied with.</p> <p>Should any infrastructure need to be placed directly within an active channel of any freshwater resource, a WUL will be required and must be applied for by the proponent. In terms of Section 21 (c) and (i) of the NWA the relevant authorisation must be obtained from the DWS for any and all any activities that take place within the watercourses.</p> <p>The General Authorisations (GAs) for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks or characteristics of a watercourse) as defined under the NWA have been revised (Government Notice R509 of 2016). The proposed works within or adjacent to the wetland areas and river channels are likely to change the characteristics of the associated freshwater ecosystems and may therefore require authorisation. Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of a GA. A risk assessment has been undertaken for the proposed project and is discussed in Section 1.5.7 of the Aquatic Impact Assessment (Appendix D.2).</p>	Department of Water Affairs	1998
Integrated Environmental Management (IEM) guideline series published by the DEA (various documents dated from 2002 to present)	The IEM Guideline series provides guidance on conducting and managing all phases and components of the required BA and PPP, such that all associated tasks are performed in the most suitable manner.	National DEA	2002 - present
National Heritage Resources Act (Act 25 of 1999)	The proposed project may require a permit in terms of the National Heritage Resources Act (Act 25 of 1999) prior to any fossils or artefacts being removed by professional palaeontologists and archaeologists. Additional information regarding this is provided in the Heritage Impact Assessment (Appendix D.4).	National Department of Arts and Culture	1999
Conservation of Agricultural Resources Act (Act 43 of 1983)	The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) has categorised a large number of invasive plants together with associated obligations of the land owner. Invasive plant species that should be removed or	National Department of Agriculture	1983

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
	<p>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. The Terrestrial Ecology Impact Assessment (Appendix D.1 of this BA Report) explains that given the harsh environment prevalent within the area, the propensity for alien exotic plant species to establish in the area is limited and allows for ease of management, should exotic weed species be identified.</p>		
<p>Northern Cape Nature Conservation Act (Act 9 of 2009)</p>	<p>All species listed by the Northern Cape Nature Conservation Act (Act 9 of 2009) will require removal permits should they be impacted upon by the construction activities.</p> <p>The Northern Cape Conservation Act under its pertinent regulation, governs the disturbance of species listed in the Terrestrial Ecology Impact Assessment (included in Appendix D.1 of this BA Report), or possibly other species not yet identified on the site. As noted above, a permit from the Provincial Department of Environment and Nature Conservation (DENC) will be required in order to disturb or translocate such species.</p> <p>The absence or presence of these species will be confirmed as part of the plant rescue and protection plan and should any species be present and determined that they will be impacted on, permits will be obtained from DENC in this regard.</p>	<p>Northern Cape Department of Environment and Nature Conservation</p>	<p>2009</p>
<p>Western Cape Nature and Environmental Ordinance 19 of 1974 (amended by the Western Cape Nature Conservation Laws Amendment Act (Act 3 of 2000))</p>	<p>The Western Cape Nature and Environmental Ordinance 19 of 1974 (amended by the Western Cape Nature Conservation Laws Amendment Act (Act 3 of 2000)) provides protection status for plants. The removal or relocation of protected plant species require a permit from CapeNature.</p> <p>According to Section 63(1) of the Western Cape Nature Conservation Laws Amendment Act (Act 3 of 2000), no person shall a) uproot the plant in the process of picking the flower of any flora; (b) without a permit (i) pick any endangered or protected flora, or (ii) pick any flora on a public road or on the land on either side of such road within a distance of ninety metres from the centre of such road, or (c) pick any protected or indigenous unprotected flora on land of</p>	<p>CapeNature</p>	<p>2000</p>

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
	<p>which he or she is not the owner, without the permission of the owner of such land or of any person authorised by such owner to grant such permission.</p> <p>The absence or presence of these species will be confirmed as part of the plant rescue and protection plan and should any species be present and determined that they will be impacted on, permits will be obtained from CapeNature in this regard.</p>		
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004)</p>	<p>This Act serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. The proposed development, may not necessitate any particular application for a change in land use from an ecological perspective, however the effective disturbance and removal of species identified in the Terrestrial Ecology Impact Assessment (included in Appendix D.1 of this BA Report), as well as possible other species (i.e. TOPS species), will require specific permission from the applicable authorities.</p> <p>In addition, the planting and management of exotic plant species on route, if and where required, will be governed by the Alien and Invasive Species (AIS) regulations, which were gazetted in 2014. These regulations compel landowners to manage exotic weeds on land under their jurisdiction and control.</p>	<p>National DEA</p>	<p>September 2004</p>
<p>Astronomy Geographic Advantage (Act 21 of 2007)</p>	<p>The Astronomy Geographic Advantage (Act 21 of 2007) aims is to provide for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy; to provide for intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and to provide for matters connected therewith. The overall purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province, excluding the Sol Plaatjie Municipality, has been declared an Astronomy Advantage Area. The South African MeerKAT radio telescope is currently being constructed about 90 km north-west of Carnarvon in the Northern Cape Province. The MeerKAT radio telescope is a precursor to the SKA telescope and will be integrated into the SKA Phase 1 (SKA South Africa, 2014). <u>It is not anticipated that the proposed project falls within the SKA buffer area.</u> However, this will be confirmed with the SKA office</p>	<p>Department of Science and Technology</p>	<p>2007</p>

Title of legislation, policy or guideline	Applicability to the Proposed Project	Administering Authority	Date
	<p>during the 30-day review period of the Draft BAR.</p> <p>The South African Astronomical Observatory is located approximately 30 km from the proposed power line route.</p>		
Subdivision of Agricultural Land Act (Act 70 of 1970)	An application for the change of land use (re-zoning) for the development on agricultural land will be lodged by the applicant for approval in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) as required. A servitude for the proposed power line will need to be registered on the affected farm portions.	Republic of South Africa	1970

SECTION B: DESCRIPTION OF THE AFFECTED ENVIRONMENT

The information presented in this section has been derived from the specialist studies that are included in Appendix D of this BA Report. The specialist declarations of interest are included in Appendix H of this BA Report.

1. PROPERTY DETAILS

Table 10 provides the details of the affected properties for the proposed project.

Table 10: Details of the Affected Properties

Province	Northern and Western Cape
District Municipality	Northern Cape: Namakwa District Municipality Western Cape: Central Karoo District Municipality
Local Municipality	Northern Cape: Karoo Hoogland Local Municipality Western Cape: Laingsburg Local Municipality
Ward Number(s)	Not Applicable
Farm name and number	<ol style="list-style-type: none"> 1. Remaining Extent of Beeren Valley Farm 150 2. Remaining Extent of Nootgedacht Farm 148 3. Remaining Extent of Hartebeeste Fontein Farm 147 4. Portion 1 of Farm 219 5. Remaining Extent of Farm 219 6. Remaining Extent of Farm 280 7. Portion 1 of Rheebockenfontein Farm 4 8. Portion 2 of Rheebockenfontein Farm 4 9. Portion 2 of Farm De Molen 5 10. Portion 6 of Farm Hamelkraal 16 11. Portion 7 of Farm Hamelkraal 16 12. Remaining Extent of Spitskop Farm 20
Portion number	<ol style="list-style-type: none"> 1. Remaining Extent of Beeren Valley Farm 150 - Portion 0 2. Remaining Extent of Nootgedacht Farm 148 - Portion 0 3. Remaining Extent of Hartebeeste Fontein Farm 147 - Portion 0 4. Portion 1 of Farm 219 - Portion 1 5. Remaining Extent of Farm 219 - Portion 0 6. Remaining Extent of Farm 280 - Portion 0 7. Portion 1 of Rheebockenfontein Farm 4 - Portion 1 8. Portion 2 of Rheebockenfontein Farm 4 - Portion 2 9. Portion 2 of Farm De Molen 5 - Portion 2 10. Portion 6 of Farm Hamelkraal 16 - Portion 6 11. Portion 7 of Farm Hamelkraal 16 - Portion 7 12. Remaining Extent of Spitskop Farm 20 - Portion 0
SG Code	<ol style="list-style-type: none"> 1. C07200000000015000000 2. C07200000000014800000 3. C07200000000014700000 4. C07200000000021900001 5. C07200000000021900000 6. C04300000000028000000 7. C0430000000000400001 8. C0430000000000400002 9. C0430000000000500002 10. C04300000000001600006 11. C04300000000001600007 12. C04300000000002000000
Current land-use zoning	Agricultural land-use - mainly livestock grazing. A servitude for the proposed power line will need to be registered on the affected farm portions.

2. GRADIENT OF THE SITE

The proposed power line runs along the plateau at the edge of the escarpment at an altitude of approximately 1 600 metres and then drops off the escarpment through very broken terrain to the plains below at an altitude of around 780 metres. There is a wide range of slopes across the broken terrain. The study area partially straddles the escarpment of the Klein-Roggeveld and Komsberg mountain ranges, but also extends eastwards onto the plains below the plateau.

3. LOCATION IN LANDSCAPE

The general site, including the proposed power line routing to the proposed MTS, is best described by the following landscape or landforms:

- Ridgeline;
- Plateau;
- Side slope of mountain;
- Closed valley;
- Open valley; and
- Undulating plain.
- Natural area;
- Agriculture (sheep and game farming);
- River, Stream or Wetland;
- Mountain, Koppie or Ridge; and
- Archaeological Site (Refer to explanation in Section 9 below)

The section below provides a summary of the affected environment. A detailed description of the affected environment is provided in all the specialists studies included in Appendix D of this BA Report.

4. SOIL AND GEOLOGY OF THE SITE

The land type classification is a nationwide survey that groups areas of similar soil, terrain and climatic conditions into different land types. The proposed power line crosses several very similar Fc³ and Ib land types that are dominated by rock outcrops and shallow Mispah and Glenrosa soil forms on underlying rock. In terms of the soil and geological stability of the site, the general site, including the proposed power line routing occurs on steep slopes with loose soil. The underlying geology of the project area is mudstone, siltstone and sandstone of the Beaufort Group, Karoo Supergroup.

The ridges are generally sandstone with very shallow, rocky soils. The lower-slopes and valley bottoms are largely underlain by shale, which may form loose gravel on the slopes or give rise to a heavier clay soil on the flat areas. Some of the lower slopes and plains contain coarse sands and gravels of a quartzitic nature. The soils are typically Glenrosa and / or Mispah forms and lime is generally present. Glenrosa has a low erodibility when occurring on flat or gentle slopes but increases on steeper slopes of ridges, hills and mountains. This is often ameliorated by stony deposits that reduce runoff intensity. Mispah soil is often found in association with Glenrosa and has a low erodibility (Belcher, 2019).

A description of the site is provided in the Heritage Impact Assessment in Appendix D.4. It is noted that because the areas above and below the escarpment are so different, they are described separately.

³ Fc land type refers to land where lime is generally present throughout the entire landscape. The Land Type la is characterised by a soil pattern difficult to accommodate elsewhere, at least 60% of which comprises pedologically youthful, deep (more than 1 m to underlying rock) unconsolidated deposits. The Land Type Ib indicates land types with exposed rock, stones or boulder outcrops covering 60-80% of the area". Land Type Survey Staff, 2012. Land types. Memoirs on the Agricultural Natural Resources of South Africa No. 30. ARC-Institute for Soil, Climate and Water, Pretoria.

Atop the escarpment the study area is comprised of gently undulating hills. The vast majority is undeveloped land, but some small areas of agricultural land do occur in the wider area (the nearest to the power line route is about 1 km away). Although the terrain is often very rocky, the rocks tend to be flat. Small ridges do protrude in places though. Vegetation cover is usually low but, because of the slightly higher rainfall on the escarpment, it is fairly continuously present. In the river valleys there is somewhat denser bush. Although the rock is largely quite solid sandstone, there are places where dark shale bands occur which are eroding heavily. These are generally present on slopes or on the sides of incised valleys.

For the central part it is noted that the proposed power line route runs down an exposed 6 km long ridgeline from the edge of the escarpment into a river valley and then on across the plains.

The easternmost part of the study area that lies within Western Cape was mildly undulating with stream beds of varying size but was much less rocky than the escarpment area. Low scarps occurred in places with the largest of these being in the region of 20 m high. The southern part of the study area is very flat and dominated by river floodplains. The main relief is a slightly higher-lying area to the west of the line where the substation would be built. The bulk of the visible bedrock in the Western Cape portion of the study area was highly weathered shale but the remains of more resistant rocks were often lying on the surface as gravel. Fine gravel tended to be widespread on the surface.

5. GROUND COVER

The information presented below has been summarised from the Terrestrial Ecology Impact Assessment, the Aquatic Freshwater Impact Assessment and the Heritage Impact Assessment (Appendix D.1 and Appendix D.2 and Appendix D.4 respectively of this BA Report).

According to the national vegetation map, there are three vegetation types along the power line routing (Figure 18). The initial section on the plateau towards the wind farm is classified as Roggeveld Shale Renosterveld, the central section of the 132 kV line is Central Mountains Shale Renosterveld and the final section of 132 kV line as well as the MTS and 400 kV power line fall within the Gamka Karoo vegetation type (Todd, 2019). The vegetation reflects the varied topography and associated geology of the area with Central Mountain Shale Renosterveld occurring predominantly on the ridges, Roggeveld Shale Renosterveld on the low hills and broad shallow valleys, while Gamka Karoo dominates the lowlands (Belcher, 2019).

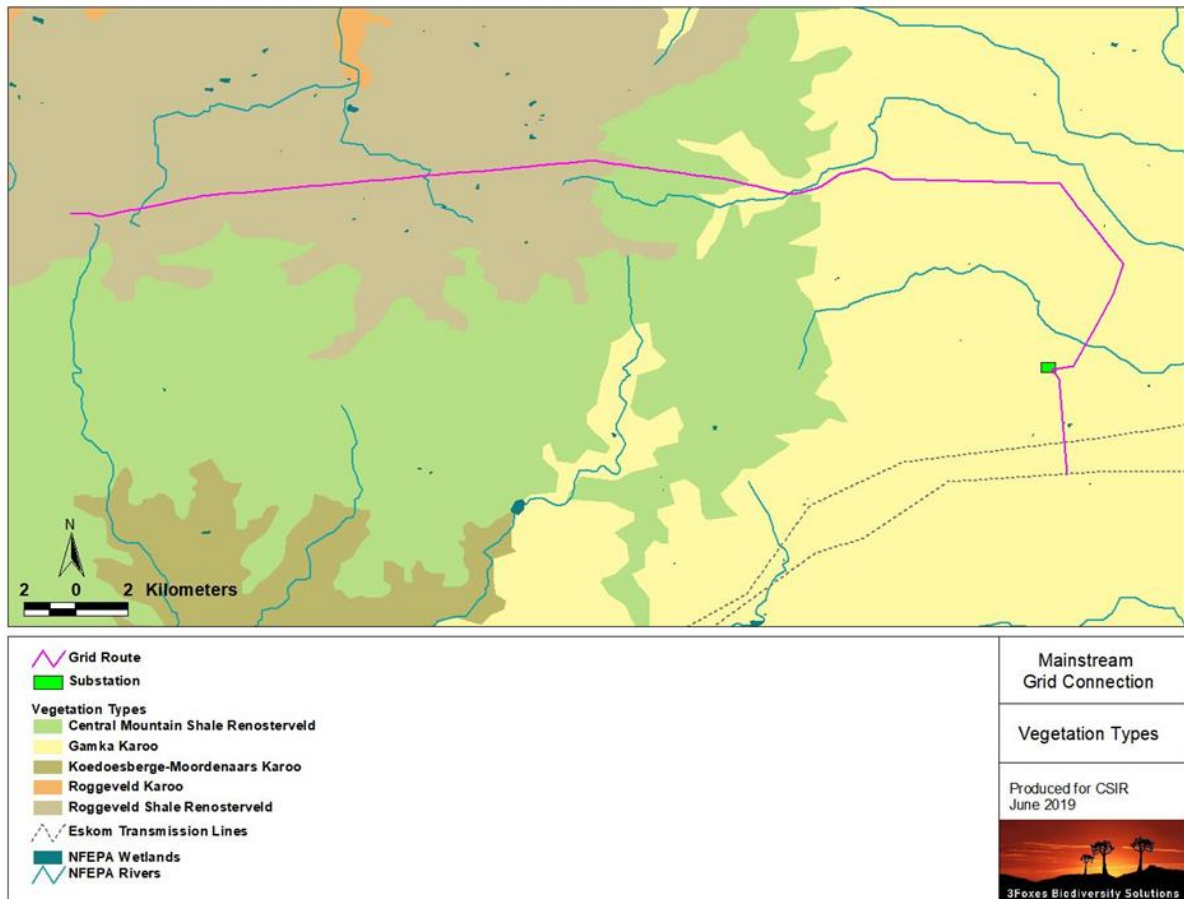


Figure 18: Vegetation map of the power line routing, including the substation site and the 400 kV section to the existing Eskom Grid (Todd, 2019).

Roggeveld Shale Renosterveld consists of moderately tall shrublands dominated by renosterbos *Elytropappus rhinocerotis*, with many geophytes such as *Geissorhiza heterostyla* and *Spiloxene capensis* occurring in the wetter and more rocky habitats. Central Mountain Shale Renosterveld comprises of a low, open to medium density shrubland with a medium dense matrix of short, divaricate shrubs, dominated by renosterbos. All of these vegetation types are regarded as “Least Threatened”.

The vegetation associated with the ephemeral tributaries is not clearly defined from the surrounding terrestrial vegetation. The vegetation along the larger watercourses within the study area such as the Juk and Vanwyks Rivers comprises largely of *Vachellia karroo* dominated thickets with *Searsia burchellii*, *S. lancea*, *Carissa bispinosa* and *Euclea undulata* fringed by *Stipagrostis* spp. grass within the sandy floodplains. Most of the vegetation associated with the aquatic features within the valley floors in the study area is still largely natural and contains little to no of invasive alien plants (Belcher, 2019).

6. DESCRIPTION OF THE VEGETATION

As noted above, the proposed power line routing traverse primarily Roggeveld Shale Renosterveld, Central Mountain Shale Renosterveld and Gamka Karoo (Figure 18). All these vegetation types are considered to be “Least Threatened” from a conservation perspective.

Much of the study area falls within Roggeveld Shale Renosterveld. This vegetation type occurs in the Northern and Western Cape. It occupies the majority of the Roggeveld from the edge of the Western edge of the Great Escarpment mostly above the Tanqua Basin, reaching as far east as the

higher-lying areas of the Teekloof Pass south of Fraserburg along the northwest summit plateaus of the Nuweveldberge. It occupies undulating, slightly sloping plateau landscapes, with low hills and broad shallow valleys supporting mainly moderately tall shrublands dominated by renosterbos with a rich geophytic flora in the wetter and rocky habitats. It occurs mostly on mudrocks and sandstones of the Adelaide Subgroup. The land types present are mostly Fc and Da. Mucina & Rutherford (2006) list 12 endemic species for this vegetation type, which is a large number given that the total extent of the vegetation type is only 2 917 km².

According to Mucina & Rutherford (2006) Central Mountain Shale Renosterveld occurs in the Western and Northern Cape on the southern and southeastern slopes of the Klein Roggeveldberge and Komsberg below the Komsberg section of the Great Escarpment as well as farther east below Besemgoedberg and Suurkop and in the west in the Karookop area. It is associated with clayey soils overlying Adelaide Subgroup mudstones and subordinate sandstones with land types mostly lb and Fc. Although this vegetation type is classified as Least Threatened, it has a very limited extent of 1 236 km² and is not formally conserved anywhere. Levels of transformation are however low and it is considered to be about 99% intact. Although no endemic species are known to occur within this vegetation type, little is known about this Renosterveld type and it has been poorly sampled. Experience from other projects in the area indicate that this should be considered to be a relatively sensitive vegetation type with a relatively high abundance of species of conservation.

The Gamka Karoo vegetation type has a total extent of 20 324 km² and occurs in the large basin bounded by the Nuweveld Mountains in the north and northwest and the Swartberg and adjacent Cape Fold Mountains in the south. Gamka Karoo is classified as Least Threatened and less than 1% has been transformed (Mucina & Rutherford 2006). The vegetation type is however poorly protected as less than 2% falls within formal protected areas compared to the target of 16%. Gamka Karoo is characterised by irregular to slightly undulating plains covered in dwarf spiny shrubland dominated by karoo dwarf shrubs, with occasional low trees. Dense stands of perennial bunchgrasses cover broad sandy bottomlands. Geology consists of mudstones and sandstones of the Beaufort Group with some Ecca shales supporting very shallow and stony soils of the Glenrosa and Mispah forms, typical of the Fc land type. It is regarded as one of the most arid units of the Nama-Karoo Biome, with rainfall varying from 100 mm in some areas in the rain shadow of the Cape Fold Mountains to about 240 mm against the great escarpment.

Overall, the Terrestrial Ecosystems on site are classed as Least Threatened in terms of Ecosystem Threat Status as per the National Environmental Management: Biodiversity Act (Act 10 of 2004).

7. SURFACE WATER

In terms of surface water, a detailed Aquatic Ecology (Freshwater) Impact Assessment is included in Appendix D.2 of this BA Report, which provides information on the surface water systems (including non-perennial rivers and wetlands) and aquatic ecology. The information provided below has been extracted from the Aquatic Ecology (Freshwater) Impact Assessment. Information regarding the sensitive freshwater features is also described in Section A (5) of this BA Report.

The Aquatic Ecology (Freshwater) Impact Assessment that has been undertaken as part of the BA process identified the Riet, Vanwyks, Juk and Oubergs Rivers and their associated smaller tributaries and wetland areas within the investigation area that may be impacted on by the proposed project. The rivers associated with the study area are shown in Figure 6 of this BA Report.

While the extreme western extent of the power line starts within the Portugals River Catchment, it does not cross any of the associated watercourses. Within this section of the power line, the line only crosses the Riet River tributaries along the high lying areas at the very upper reaches of the watercourses.

Towards the middle section of the western section, the power line crosses the upper Riet River and its tributaries and then passes eastwards along a ridge between two tributaries of the Vanwyks River. Towards the eastern section, the power line crosses the middle reaches of the Vanwyks

River, its tributaries and the associated valley bottom and floodplain wetlands. The service road deviation is also located within this section, directly adjacent to the floodplain of the Vanwyks River.

The power line also crosses the middle reaches of the Vanwyks, Juks and Oubergs Rivers, its tributaries and the associated valley bottom and floodplain wetlands. The proposed location of the MTS is within the upper to middle reaches of Juks River. It has been located to try and avoid the watercourses as far as possible and only a few minor watercourses occur within the footprint.

The Riet River and the tributaries of the Riet River and Portugal's River have a largely natural to moderately modified Present Ecological State (PES). Both the Juk River and Vanwyks River have a moderately modified PES.

The study area is located largely within upstream FEPA rivers that should not be impacted such that they would result in degradation of more ecologically important downstream FEPA rivers. There are several instream wetland areas within the channels of the larger watercourses that have been mapped as artificial FEPA wetlands of which only two are located near the proposed works. A natural depression is the only mapped natural FEPA wetland located in the wider study area but is at least 500 m south of the proposed line in the upper Riet River.

Due to the relatively remote nature of the terrain, and minimal anthropogenic activity within the study area and greater catchment of these resources, few impacts have occurred. Modifications to these systems are primarily as a result of agriculture (livestock farming) such as overgrazing, fences and roads traversing systems, and impoundment of larger systems. Due to the ephemeral nature of most of the river systems in the area, abstraction of water is not prevalent. Very little alien vegetation was observed during the specialist site assessments, and where alien invasive flora was observed, the encroachment was not considered to be severe at this time.

8. BIODIVERSITY

Refer to the respective Terrestrial Ecology Impact Assessment and Aquatic Ecology (Freshwater) Impact Assessment in Appendix D.1 and Appendix D.2 respectively of this BA Report for a complete description of the biodiversity occurring on the site and associated potential impacts of the proposed project activities.

8.1. Biodiversity Planning Categories

In terms of Biodiversity Planning Categories, the proposed project areas fall within a CBA, ESA, and Other Natural Area (ONA). The proposed project site falls within the planning domain of the Western Cape and Northern Cape.

As noted above, a detailed Terrestrial Ecology Impact Assessment is included in Appendix D.1 of this BA Report, which provides a detailed description of the terrestrial ecology (flora and fauna) associated with the proposed project area. A detailed Aquatic Ecology (Freshwater) Impact Assessment is included in Appendix D.2 of this BA Report, which provides a detailed description of the aquatic ecology of the proposed project area.

Critical Biodiversity Areas, Ecological Support Areas and Other Natural Areas:

- **Terrestrial Critical Biodiversity Areas**

The Critical Biodiversity Areas map for the study area is depicted below in Figure 19 and is composed of the 2017 Northern Cape CBA map and the 2017 Western Cape BSP for the Laingsburg municipality. There are some short sections of the power line route within the Western Cape that are CBA 1 associated with water courses. Within the Northern Cape, a large part of the route is either CBA 1 or CBA 2. Development within CBAs can have negative impacts on biodiversity pattern and process and is generally considered undesirable. The footprint within the CBAs would however

be low and the ecological functioning of the CBAs would not be compromised by the development. Overall the impact of the development on CBAs and broad-scale ecological processes would be low and no major impacts on ecological processes would occur.

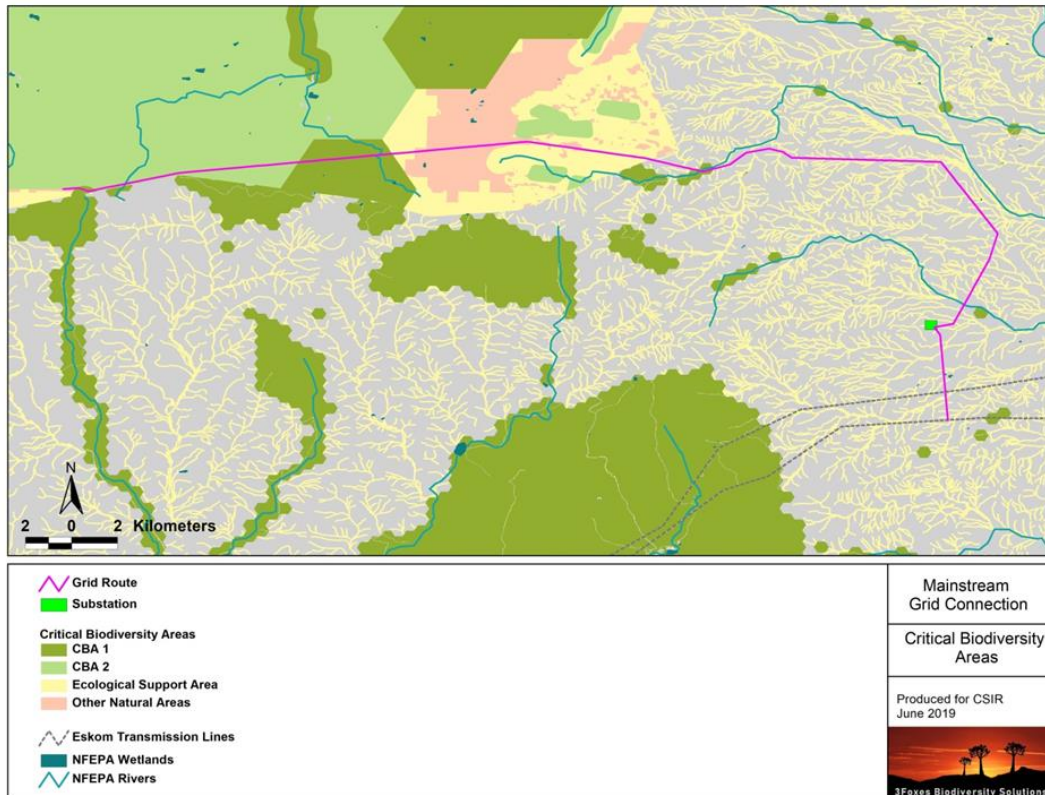


Figure 19: Critical Biodiversity Areas and Ecological Support Areas for the study area, which is based on the CBA map for the Northern Cape and the Western Cape BSP for the Laingsburg District.

The Terrestrial Ecology Assessment notes that the proposed power line, MTS and associated infrastructure are located in a potentially sensitive area which includes the Roggeveld Centre of Endemism as well as potential habitat of the Riverine Rabbit and several other listed fauna, some of which can be confirmed present. The footprint of the 132 kV section of the power line can however be reduced to a low level and sensitive habitats such as the major drainage systems along the route can also largely be avoided. A pre-construction walk-through of the final approved power line route and development footprint is recommended in order to refine the final pylon locations and minimise impacts on SCC and sensitive habitats. The major residual risk factor associated with the 132 kV section of the route is likely to be erosion associated with disturbance on the steep mountain slopes the route passes through on the way to the new substation.

The 400 kV section of the power line traverses the open gravelly plains of the Gamka Karoo to the connection point with the Eskom 400 kV power lines. The major sensitive feature along this section of the route is the drainage lines with associated floodplains which traverse this area. As the spans between pylons in this area would be large, there are no drainage lines that could not be spanned by the power line. As such, impact on these features can be reduced to a low acceptable level (Todd, 2019).

- **Aquatic Critical Biodiversity Areas**

There are three freshwater biodiversity conservation mapping initiatives of relevance to the study area due to the fact that the site is split over two provinces: the national Freshwater Ecosystem Priority Areas (FEPAs) and the 2017 Western Cape Biodiversity Spatial Plan (WCBSP) for the Laingsberg Local Municipality (for the external extent) and the 2016 Northern Cape Critical Biodiversity Area (for the western extent).

The only aquatic CBAs within the study area are sections of river where they occur within terrestrial CBAs (CBA1). As noted previously, the only aquatic CBA crossed by the proposed transmission line is on the Vanwyks River approximately 4 km downstream of the Western Cape border. As for the FEPA River status, the river is considered of high ecological importance in terms of its unique habitat and linked to terrestrial habitat and vegetation. The remainder of the watercourses are mapped as aquatic ESAs (ESA1). Most of the terrestrial areas adjacent to the watercourses in the area are mapped as ONAs (Figure 20).

Within the Northern Cape CBA mapping of 2016, most of the area is mapped as a CBA, becoming an ESA to the east of the study area within the eastern portion of the study area in the Northern Cape. This would imply that for the watercourses within this area, the ecological integrity of these features within the CBAs should be preserved while the ecological functionality of the watercourses within the ESAs needs to be retained.

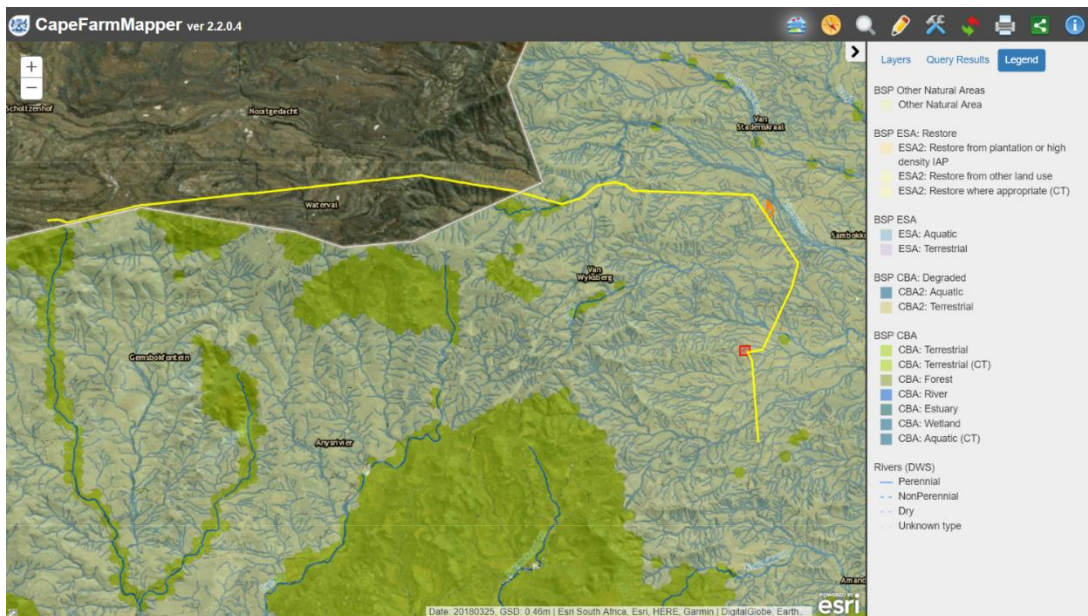


Figure 20: The 2017 Western Cape Biodiversity Spatial Plan for Witzenberg Municipality (CapeFarmMapper, 2019).

The rivers within the study area are still in a natural condition in their upper reaches with few modifications (some roads and very small dams). Downstream, in the middle reaches of the Vanwyks, Juk and Oubergs Rivers, the rivers become largely natural to moderately modified. The riparian habitat is slightly more degraded as a result of direct habitat modification from the surrounding farming activities.

The larger watercourses in the study area, the Riet, Vanwyks, Juk and Oubergs Rivers, have a high ecological importance and sensitivity while the smaller tributaries/drainage features are of a moderate ecological importance and sensitivity. The larger watercourses tend to be more ecologically important but less sensitive to impacts while the smaller tributaries are less ecologically important but more sensitive to flow, water quality and habitat modification. The hillslope seeps and the vernal pools are in a natural ecological condition while the valley bottom wetlands have been slightly modified but are still in a largely natural ecological condition. The floodplains although still largely natural, are the most impacted by the activities within the valley floor. The wetland features are considered of high ecological importance and sensitivity (Belcher, 2019).

8.2. Habitat Condition

This section provides a description of the habitat condition on site, as well as an estimated percentage of habitat condition class and a description (Table 11).

Table 11: Habitat Condition on Site

Habitat Condition	Percentage of habitat condition class	Description
Natural	More than 90%	Much of the area aligns with the identified Roggeveld Shale Renosterveld, Roggeveld Karoo, Central Mountain Shale Renosterveld and Gamka Karoo vegetation types. Although the site is considered to be overgrazed to some extent.
Near Natural	Approximately 5%	Some portions of the surrounding area have been subject to alteration primarily on account of extensive grazing and other agricultural activities. The Aquatic Ecology (Freshwater) Impact Assessment (Appendix D.2 of this BA Report) notes that most of the vegetation associated with the aquatic features within the valley floors in the study area is still largely natural and contains little to no of invasive alien plants.
Degraded	0%	
Transformed	Approximately 5%	Minor portions of the land in and around the subject sites have been transformed to accommodate infrastructure such as roadways and farm homesteads.

9. LAND USE CHARACTER OF SURROUNDING AREA

The following land uses and/or prominent features currently occur within a 500 m radius of the site:

- Natural area;
- Agriculture (sheep and game farming);
- River, Stream or Wetland;
- Mountain, Koppie or Ridge; and
- Archaeological Site (Refer to explanation in Section 10 below)

Visual character is descriptive and non-evaluative, which implies that it is based on defined attributes that are neither positive nor negative. A change in visual character cannot be described as having positive or negative attributes until the viewer's response to that change has been taken

into consideration. The probable change caused by the project is assessed against the existing degree of change caused by previous development.

The basis for the visual character of the study area is provided by the geology, vegetation and land use of the area, giving rise to a typical Karoo landscape - a predominantly mountainous / hilly landscape under predominantly natural cover with wide vistas and limited rural activities (grazing and game farming) and isolated farmsteads. The visual environment is dominated by the dramatic escarpment (Great Escarpment). From the lower lying regions in the south and east, the escarpment appears as a steep mountain range known as the Komsberg.

The remoteness of the study area and the low level of human influence results in a mostly untransformed / natural landscape. The visual quality of the area is largely ascribable to the open character of the landscape with spectacular and rugged mountains covered in natural shrub vegetation. The landscape and lack of human influence creates a sense of 'wilderness'. The steeply incised valleys of the Dwyka, Tronk and Blouval Rivers provide visual interest in the landscape. Some vertical elements detract from the visual quality in the study area, notably the existing 132 kV power lines west of the WEFs and several high voltage transmission lines to the south, below the escarpment.

The vast 400 000 km² Karoo cultural landscape has a defined sense of place in terms of its open setting and sense of wilderness invoked when visiting, partly due to the predominantly natural landscape and relatively limited human influence throughout the region. The study area is not particularly distinct from the Karoo landscape with possible exception of the dramatic escarpment.

10. CULTURAL/HISTORICAL FEATURES

As noted above, a Heritage Impact Assessment (Palaeontology, Archaeology and Cultural Landscape) has been undertaken as part of this BA process and the complete study is included in Appendix D.4 of this BA Report. The information provided below has been extracted from the Heritage Impact Assessment. In addition, refer to Section A (5) and Section B (8) of this BA Report for a description of the sensitive archaeological and palaeontological material found on site.

As noted above, the proposed power line routing and connection to the MTS will occur within the Northern and Western Cape. Therefore, both the South African Heritage Resources Agency (SAHRA) and Heritage Western Cape (HWC) are required to provide comments on the proposed project for the Northern Cape and Western Cape, respectively. In line with this, a Notification of Intent to Develop (NID) was submitted to the HWC for the proposed project.

A HIA, in accordance with provisions of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999) has been prepared by Orton (2019; with the PIA undertaken by Almond, 2019) and will be submitted to HWC for approval. The HIA has specific reference to impacts on archaeological and palaeontological heritage resources as well as on the cultural landscape, with an integrated set of recommendations.

As required by HWC, the draft HIA has been made available to the Laingsburg Local Municipality for comment for a 30-day period, which concludes in November 2019. Once the comment period ends, any comments from the municipality will be addressed within the HIA (if and where applicable), and the Final HIA will be submitted to the HWC for decision-making.

In terms of archaeology and cultural landscape, much of the study area is very remote and located on high ground close to the edge of the escarpment. This assessment has found that the study area around the proposed power line route and associated electrical infrastructure does contain some significant heritage resources. These include prehistoric and historical archaeological sites, palaeontological occurrences and the escarpment landscape. The north-eastern part of the power line route was routed by the heritage specialist especially to avoid significant heritage sites, but one small historical engraving lies along the southernmost part of the route. Because the power line here will be 400 kV it should be easy to span this site and avoid physical damage. The central part

of this route could not be surveyed in the field and will need to be covered pre-construction. It is noted that the Stone Age kraal complex (at waypoint 546) is bisected by an access road that might be used during the proposed development. The rural cultural landscape extends throughout the study area but, aside from fences and farm tracks, human interventions are generally very sparse. The greater landscape, especially along the escarpment, is visually significant, but because it lies within the Komsberg REDZ the area is very likely to be devoted to renewable energy developments and the proposed power line and associated electrical infrastructure would thus not be out of place. Importantly, the proposed power line would not be built if the renewable energy facilities it is meant to support do not go ahead.

Archaeological remains are generally scarce but are found throughout the area. Stone Age material was rare with a precolonial kraal complex (Northern Cape) and a geometric rock art site (Western Cape) being the most significant sites recorded. Isolated stone artefacts were remarkably rare, especially above the escarpment, but a few small scatters were recorded on the plains below the escarpment (Western Cape). The vast majority of archaeological remains found were historical and ranged from a ruined farm complex to small, isolated ruined structures and isolated individual artefacts. Several sites lie close to the alignment but the eastern part of it was devised by the present author to avoid these sites. Some graveyards and buildings are present in the wider area but all are located well away from the proposed power line alignments and no impacts are expected.

In terms of palaeontology, although palaeontological resources were found throughout much of the study area, the vast majority were of low significance. The proposed project study area extends from the Roggeveld Plateau eastwards into the western Koup region at the foot of the Besemgoedberg Escarpment, to the west of Merweville. It is entirely underlain by continental sediments of the Abrahamskraal Formation (Lower Beaufort Group) of Middle Permian age. This fluvial and lacustrine succession is generally assigned a high palaeontological sensitivity due to its rich fossil biota including pareiasaur reptiles, a wide range of therapsids, fish, amphibians, petrified wood and other remains of the Glossopteris Flora as well as trace fossils and microfossils. The Palaeozoic sedimentary bedrocks are extensively covered by Late Caenozoic superficial sediments (e.g. scree, gravelly soils) that are usually unfossiliferous.

Fossil material recorded from the Abrahamskraal Formation during a seven-day field-based survey of the broader study region between Sutherland and Merweville includes sparsely-scattered, and often highly-weathered, bones of unidentified robust-bodied tetrapods (probably pareiasaurs and / or dinocephalians) with only one well-articulated post-cranial skeleton. Trace fossils include several tetrapod burrow casts, lungfish burrows and low-diversity invertebrate trace assemblages. An extensive surface scatter of petrified wood blocks, some of which are well-preserved, was located in the western Koup. With the exception of the articulated skeleton and petrified wood scatters which lie well away from the electrical infrastructure footprint, most of these fossil occurrences are of limited palaeontological value. Fossil occurrences within or close to the footprint are of low conservation significance and do not warrant mitigation. The overall palaeontological sensitivity of the Electrical Grid Infrastructure footprint is rated as low.

Based on the findings of the PIA, it is concluded that the overall palaeontological sensitivity of the Electrical Grid Infrastructure study area is rated as low. The South African Heritage Resources Information System (SAHRIS) PalaeoSensitivity map indicates the entire study area with a very high sensitivity. However, this is a provisional sensitivity assigned to the entire Lower Beaufort Group. The overall conclusion of the specialist study is based on the research and fieldwork studies. Refer to the complete Heritage Impact Assessment (included in Appendix D.4 of this BA Report) for a detailed description of the palaeontology, archaeology and cultural landscape in the region.

In terms of archaeological heritage, the National Heritage Resources Act (Act 25 of 1999) does not require the developer to obtain permits prior to construction. However, any archaeological mitigation work (i.e. test excavations, sampling etc.) that may be required (in the event of archaeological resources of significance being found within the development footprint during construction) would need to be conducted under a permit issued to, and in the name of, the

appointed archaeologist. The permit application process allows the heritage authorities to ensure that a suitably qualified and experienced archaeologist undertakes the work and that the proposed excavation/sampling methodology is acceptable.

As explained above, in terms of palaeontological heritage, where palaeontological mitigation of a development project is required, the palaeontologist concerned with mitigation work (Phase 2) would need a valid fossil collection permit from the relevant heritage management authority, i.e. HWC (for the Western Cape) or SAHRA (for the Northern Cape), and any material collected would have to be curated in an approved depository (e.g. museum or university collection). All palaeontological fieldwork and reporting should meet the minimum standards outlined by Heritage Western Cape (2016) and SAHRA (2013).

11. SOCIO-ECONOMIC CHARACTER

The information presented in this section is based on the 2001 and 2011 Census and 2016 Community Survey carried out by Statistics South Africa (Statistics SA), as well as information included in the IDPs for the municipalities.

11.1. Local Municipality

Demographic profile:

As stated above, the proposed power line will traverse farm portions located in the Northern Cape, approximately 23 km south of Sutherland and 50 km north of Laingsburg, under the jurisdiction of the Namakwa District Municipality and the Karoo Hoogland Local Municipality. The proposed power line will also traverse farm portions located in the Western Cape, under the jurisdiction of the Central Karoo District Municipality and the Laingsburg Local Municipality.

Northern Cape: Namakwa District Municipality and Karoo Hoogland Local Municipality

The Namakwa District Municipality comprises six local municipalities, namely: Richtersveld, Nama Khoi, Kamiesberg, Hantam, Karoo Hoogland and Khâi-Ma. The revised IDP 2016 - 2017 of the Namakwa District Municipality (Northern Cape Government, 2016a) explains that it is the largest district geographically in South Africa. The Namakwa District Municipality is classified as a Category C municipality, which has municipal executive and legislative authority in an area that includes more than one municipality (Statistics SA, 2016a, Page 6 and 7). The Karoo Hoogland Local Municipality is categorised as a B3 municipality, which is regarded to have small towns, with relatively small populations and significant proportions of urban population (Statistics SA, 2016a, Page 6 and 7).

As stated in the Karoo Hoogland Local Municipality revised IDP (2016 - 2017), approved in 2016 (Karoo Hoogland Local Municipality, 2016), the Karoo Hoogland Local Municipality covers an area of approximately 32 274 km² (almost 25 % of the Namakwa District Municipality total geographical area).

In 2001, the Namakwa District Municipality contained a total population of 108 111 and in 2011 it contained a total population of 115 842 (Northern Cape Government, 2016a). For the 2016 Community Survey conducted by Statistics SA, the population of the Namakwa District Municipality decreased to 115 488 (Statistics SA, 2016b). For the Namakwa District Municipality, the age structure of the population in 2001 was 23.9 % for under 15 years of age, 64 % for ages between 16 and 64 and 6.7 % for 65 years and older (Northern Cape Government, 2016a). In 2011, the population of the working age demographic (i.e. 15 to 65 years) made up 66.1 % of the population, whereas those below 15 years of age comprised 25.8 % of the population, and the above 65 years age group made up 8.1 % of the population of the Namakwa District Municipality (Northern Cape Government, 2016a).

According to the 2001 and 2011 Census, the total population was respectively recorded as 10 512 and 12 588 for the Karoo Hoogland Local Municipality (Statistics SA, 2017). For the 2016 Community Survey, the population of the Karoo Hoogland Local Municipality increased to 13 069 (Statistics SA, 2016b). In 2001, 29.7 % of the population comprised the young age group (i.e. 0 - 14 years), 62.3 % comprised the working age (15 - 64 years) and 9.1 % comprised the elderly age group (i.e. 65 years and older) in the Karoo Hoogland Local Municipality, with a dependency ratio of 63.6 % (Statistics SA, 2017). In 2011, 27.7 % of the population comprised the young age group (i.e. 0 - 14 years), 62.3 % comprised the working age (15 - 64 years) and 10 % comprised the elderly age group (i.e. 65 years and older) in the Karoo Hoogland Local Municipality, with a dependency ratio of 60.6 % (Statistics SA, 2017).

Over the period of 2004 to 2014, the population density for the Namakwa District Municipality decreased from 0.92 to 0.91 people per square kilometre, and for the Karoo Hoogland Local Municipality it increased from 0.38 to 0.43 people per square kilometre (Northern Cape Government, 2016a). According to the revised IDP 2016 - 2017 of the Namakwa District Municipality (Northern Cape Government, 2016a), factors causing a decrease or increase in population density can relate to the relief of the environment, climate, resource availability and human factors (such as political stability, and social and economic conditions).

Afrikaans is the dominant language (90.2 %) and English is the second largest language (1.2 %) spoken in the Karoo Hoogland Local Municipality (Statistics SA, 2017). The population of the Karoo Hoogland Local Municipality is predominantly Coloured (78.9 %), followed by Whites (14.6 %) and Black Africans (5.5 %), as shown in Figure 21 (Statistics SA, 2017).

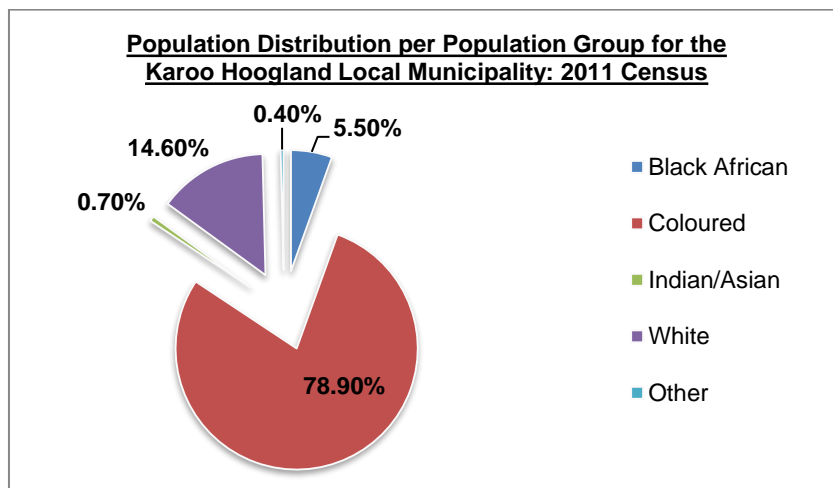


Figure 21: Percentage Distribution of Population per Population Group for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).

A total of 2 942 and 3 842 households were recorded in the Karoo Hoogland Local Municipality in 2001 and 2011 respectively, with 30.6 % (in 2001) and 30.2 % (in 2011) of the households being female headed (Statistics SA, 2017). During the 2016 Community Survey, the number of households in the Karoo Hoogland Local Municipality increased to 4 654 (Statistics SA, 2016b). In addition, 94.5 % of formal dwellings were recorded in the Karoo Hoogland Local Municipality in 2001, and this increased to 96.9 % in 2011 (Statistics SA, 2017).

Western Cape: Central Karoo District Municipality and the Laingsburg Local Municipality

The Central Karoo District Municipality comprises three local municipalities, namely: Laingsburg, Prince Albert and Beaufort West. The Central Karoo District Municipality is classified as a Category C municipality and the Laingsburg Local Municipality is categorised as a B3 municipality (Statistics SA, 2016a). The Central Karoo District Municipality is one of five districts within the Western Cape.

In terms of total population, the Central Karoo District Municipality is the smallest district within the Western Cape, however in terms of area; it is the largest (Western Cape Government, 2012). As stated in the Central Karoo District Municipality IDP (2012 - 2017), the district municipality covers a total area of approximately 38 853 km² (almost 30 % of the total geographical area of the Western Cape) (Western Cape Government, 2012).

In 2001 and 2007, the Central Karoo District Municipality contained a total population of 60 484 and 56 232 respectively, showing a declining trend (Western Cape Government, 2012). In 2011, the Central Karoo District Municipality contained a total population of 71 011, showing an increasing trend since 2007 (Statistics SA, 2016b). During the 2016 Community Survey, the population of the Central Karoo District Municipality increased to 74 247 (Statistics SA, 2016b).

According to the 2001 and 2011 Census, the total population was respectively recorded as 6680 and 8289 for the Laingsburg Local Municipality (Statistics SA, 2017). During the 2016 Community Survey, the population of the Laingsburg Local Municipality increased to 8 895 (Statistics SA, 2016b). In 2001, 29.3 % of the population comprised the young age group (i.e. 0 - 14 years), 66.3 % comprised the working age (15 - 64 years) and 7.7 % comprised the elderly age group (i.e. 65 years and older) in the Laingsburg Local Municipality, with a dependency ratio of 58.7 % (Statistics SA, 2017). In 2011, 26.5 % of the population comprised the young age group (i.e. 0 - 14 years), 66.3 % comprised the working age (15 - 64 years) and 7.2 % comprised the elderly age group (i.e. 65 years and older) in the Laingsburg Local Municipality, with a dependency ratio of 50.9 % (Statistics SA, 2017).

In 2011, the population density for the Laingsburg Local Municipality was 1 person per square kilometre (Statistics SA, 2017), which is evidence of the low population density in the area. Afrikaans is the dominant language (90.1 %) and English is the second largest language (1.6 %) spoken in the Laingsburg Local Municipality (Statistics SA, 2017). The population of the Laingsburg Local Municipality is predominantly Coloured (79 %), followed by Whites (13.3 %) and Black Africans (7 %), as shown in Figure 22 (Statistics SA, 2017).

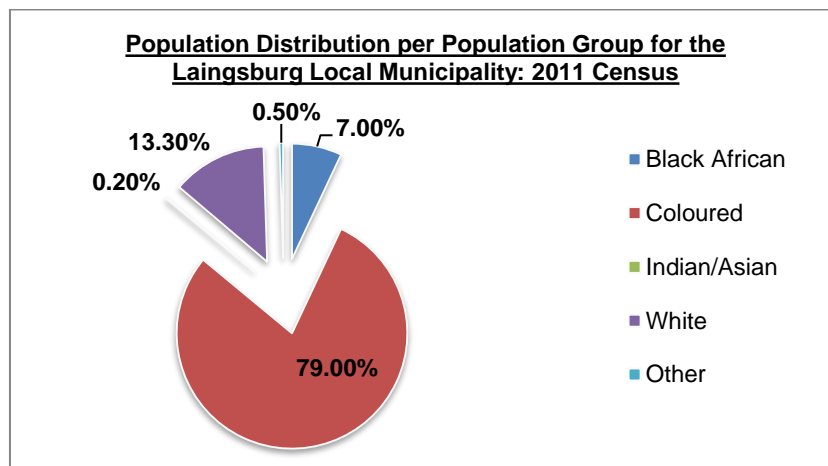


Figure 22: Percentage Distribution of Population per Population Group for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).

A total of 1922 and 2 408 households were recorded in the Laingsburg Local Municipality in 2001 and 2011 respectively, with 30.4 % (in 2001) and 31 % (in 2011) of the households being female headed (Statistics SA, 2017). During the 2016 Community Survey, the number of households in the Laingsburg Local Municipality increased to 2862 (Statistics SA, 2016b). In addition, 96.6 % of formal dwellings were recorded in the Laingsburg Local Municipality in both 2001 and 2011 (Statistics SA, 2017).

11.2. Level of Unemployment

Northern Cape: Namakwa District Municipality and Karoo Hoogland Local Municipality

The 2001 and 2011 census indicates that the Karoo Hoogland Local Municipality had an unemployment rate of 28.6 % and 14.6 %, respectively (Statistics SA, 2017). The youth unemployment rate for the Karoo Hoogland Local Municipality was recorded as 40.3 % in 2001 and 20 % in 2011 (Statistics SA, 2017). Between 2001 and 2011, the unemployment rate therefore significantly decreased by 14 %, whilst the youth unemployment rate also significantly decreased by 20.3 %.

The 2011 Census data for the employment status of the working age of the population (15 - 64 years) of the Karoo Hoogland Local Municipality indicates that 3 655 are employed, 623 are unemployed, 395 are classified as discouraged work-seekers, and 3170 are classed as not economically active (Statistics SA, 2017). This is indicated in Figure 23 below. In terms of the youth (aged 15 - 34 years), approximately 1 317 people are employed, 329 are unemployed, 218 are classified as discouraged work-seekers, and 1 433 are not economically active.

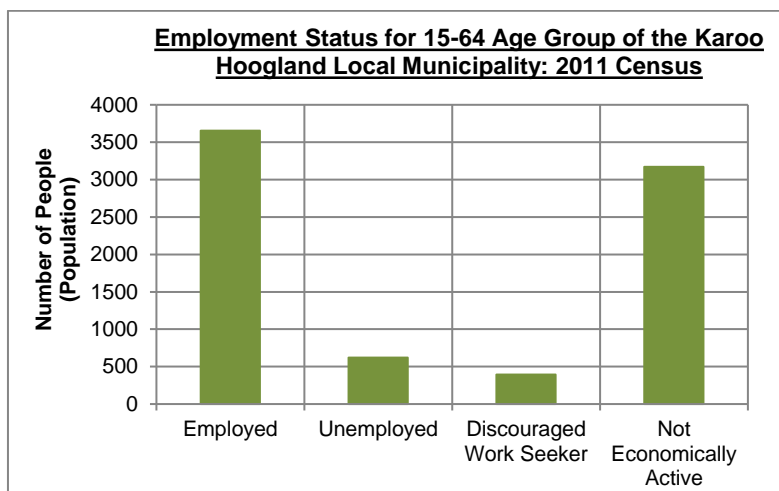


Figure 23: Employment Status for the 15 – 64 Age Group of the Karoo Hoogland Local Municipality based on the 2011 Census Data (Statistics SA, 2017).

According to the revised IDP 2016 - 2017 of the Namakwa District Municipality (Northern Cape Government, 2016a), the number of people unemployed in the Karoo Hoogland Local Municipality was 935 in 2004 and 800 in 2014, showing a decreasing trend. Conversely, 3 165 people were employed in 2004, which increased to 3 619 in 2014 for the Karoo Hoogland Local Municipality (Northern Cape Government, 2016a). Linked to this, in 2004 the unemployment rate was recorded as 22.8 % and in 2014 it was recorded as 18.1 % (Northern Cape Government, 2016a).

In 2004, the race and gender profile of unemployment within the Karoo Hoogland Local Municipality was recorded as 20.4 % African, 3.3 % White, 27.1 % Coloured and 57.8 % Asian; whilst 16.5 % of the unemployed population were males and 32.5 % were females (Northern Cape Government, 2016a). The race and gender profile of unemployment within the Karoo Hoogland Local Municipality as of 2014 stood at 12.6 % African, 4.0 % White, 20.8 % Coloured and 5.0 % Asian; whilst 15.8 % of the unemployed population were males and 21.8 % were females (Northern Cape Government, 2016a).

The revised IDP 2016 - 2017 of the Namakwa District Municipality (Northern Cape Government, 2016a), indicates that the largest employing industry within the Karoo Hoogland Local Municipality in 2014 was agriculture which employs close to 35 % of the working population, and the least being the electricity industry which employs just below 1%.

Western Cape: Central Karoo District Municipality and the Laingsburg Local Municipality

The 2001 and 2011 Census indicates that the Laingsburg Local Municipality had an unemployment rate of 26.3 % and 17.9 %, respectively (Statistics SA, 2017). The youth unemployment rate for the Laingsburg Local Municipality was recorded as 37 % in 2001 and 22 % in 2011 (Statistics SA, 2017). Between 2001 and 2011, the unemployment rate therefore significantly decreased by 8.4 %, whilst the youth unemployment rate also significantly decreased by 15 %.

The 2011 Census data for the employment status of the working age of the population (15 - 64 years) of the Laingsburg Local Municipality indicates that 2 935 are employed, 638 are unemployed, 211 are classified as discouraged work-seekers, and 1 708 are classed as not economically active (Statistics SA, 2017). This is indicated in Figure 24 below. There are 1 544 economically active youth (i.e. those people aged between 15 - 34 that are employed or unemployed but looking for work) within the Laingsburg Local Municipality and 22 % of this value are unemployed (Statistics SA, 2017).



Figure 24: Employment Status for the 15 – 64 Age Group of the Laingsburg Local Municipality based on the 2011 Census Data (Statistics SA, 2017).

According to the 2012 - 2017 IDP of the Central Karoo District Municipality (Western Cape Government, 2012), the number of people unemployed in the district municipality was 6 350 in 2007. In 2007, the race and gender profile of unemployment within the Central Karoo District Municipality was recorded as 45.0 % African, 2.6 % White, 33.4 % Coloured and 0 % Asian; whilst 24.0 % of the unemployed population were males and 38.3 % were females (Western Cape Government, 2012).

The 2012 - 2017 IDP of the Central Karoo District Municipality (Western Cape Government, 2012) explains that the majority of employment (22.6 % of the working population) in the Central Karoo District Municipality is within the agriculture sector. However, the agriculture sector is very dependent on export markets (Western Cape Government, 2012).

11.3. Economic Profile of Local Municipality

Northern Cape: Namakwa District Municipality and Karoo Hoogland Local Municipality

The Northern Cape Province has the third highest per capita income of all nine provinces; however, income distribution is extremely skewed, with a high percentage of the population living in extreme poverty. Based on the 2011 Census data, approximately 6.3 % of the households of the Karoo Hoogland Local Municipality had no income, whereas the majority of the households (i.e. 26.2 %) earned between the R 19 601 - R 38 200 income bracket, as shown in Figure 25 below, which shows the average household income distribution.

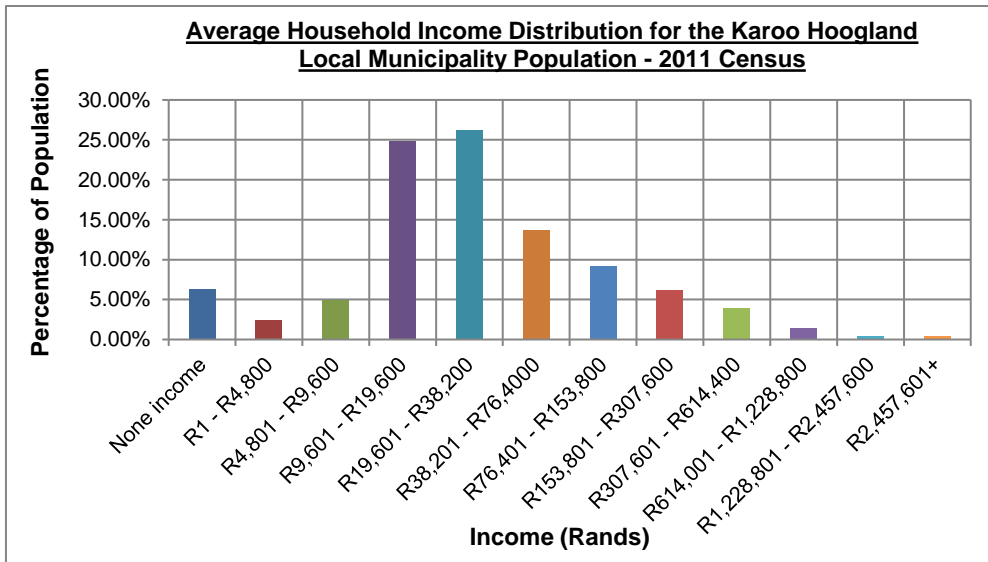


Figure 25: Average Household Income Distribution of the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).

Figure 26 below shows the annual income category of agricultural households within the Karoo Hoogland Local Municipality based on the 2011 Census data. It is evident in Figure 26 that 48 agricultural households had no income, and the majority of households (416) had an annual income of between R 4 801 and R 38 400 (Statistics SA, 2017).

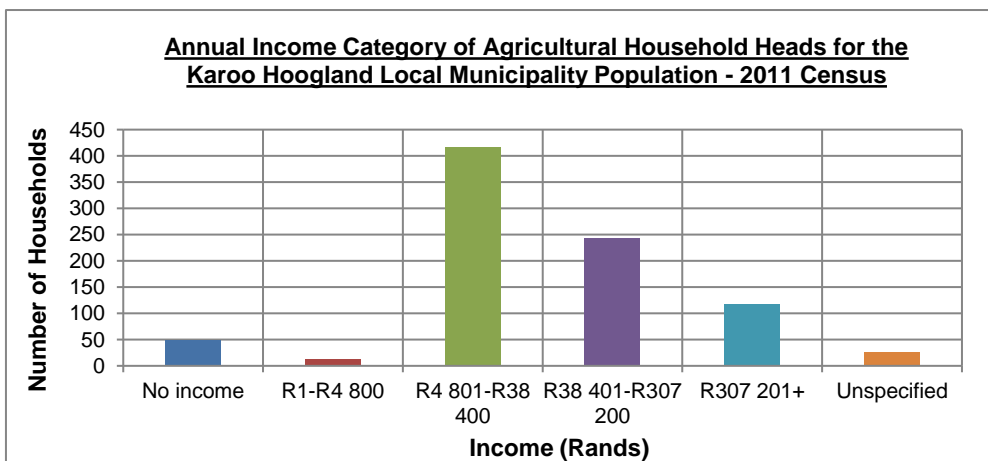


Figure 26: Annual Income Category of Agricultural Household Heads for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).

Figure 27 below shows the number of agricultural households in relation to the type of agricultural activity within the Karoo Hoogland Local Municipality based on the 2011 Census data. It is evident in Figure 27 that the majority of households (534) are involved in livestock production, followed by 454 households for poultry production, 76 households for vegetable production and 31 households for production of other crops (Statistics SA, 2017).

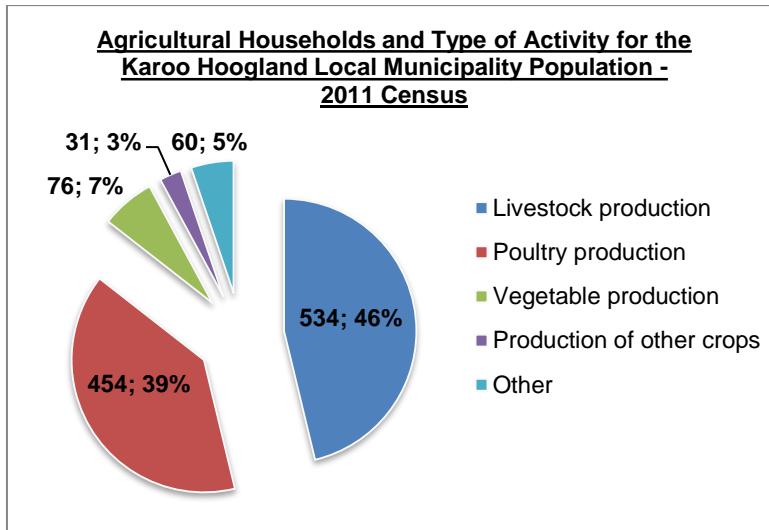


Figure 27: Agricultural Households and Type of Activity for the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).

The Karoo Hoogland Local Municipality is mainly dominated by the agriculture sector, and in 2014 the agriculture sector of both the Karoo Hoogland and Hantam Local Municipalities contributed the most towards the economic industry of the Namakwa District Municipality (Northern Cape Government, 2016a). In 2014, the agriculture industry contributed 46.4 % to the economic industry totals for the Namakwa District Municipality, followed by transport which contributed 29.4 %, construction at 28.6 %, Community Services at 25.8 %, Trade at 25.2 %, Electricity at 17.8 %, Finance at 14.5 %, Manufacturing at 14.2 % and Mining at 0.1 % (Northern Cape Government, 2016a). In 2014, the total economic contribution by the Karoo Hoogland Local Municipality to the economic industry of the Namakwa District Municipality was 17.9 %, the third highest in the Northern Cape (after Nama Khoi and Hantam Local Municipalities).

Western Cape: Central Karoo District Municipality and the Laingsburg Local Municipality

Based on the 2011 Census data, approximately 5.3 % of the households of the Laingsburg Local Municipality had no income, whereas the majority of the households (i.e. 25.4 %) earned between the R 19 601 - R 38 200 income bracket, as shown in Figure 28 below, which shows the average household income distribution.

Figure 29 below shows the annual income category of agricultural households within the Laingsburg Local Municipality based on the 2011 Census data. It is evident in Figure 29 that 23 agricultural households had no income, and the majority of households (287) had an annual income of between R 4 801 and R 38 400 (Statistics SA, 2017).

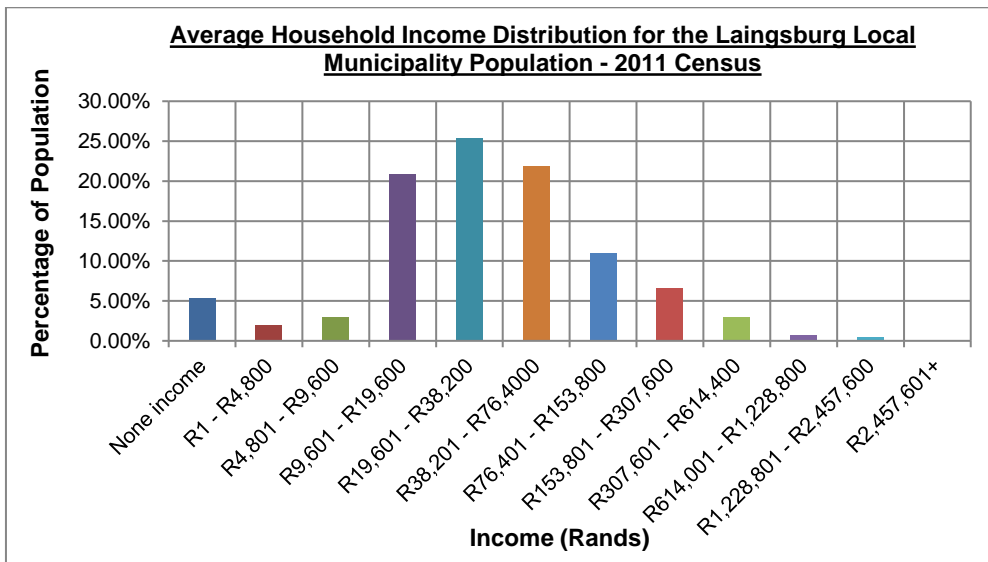


Figure 28: Average Household Income Distribution of the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).

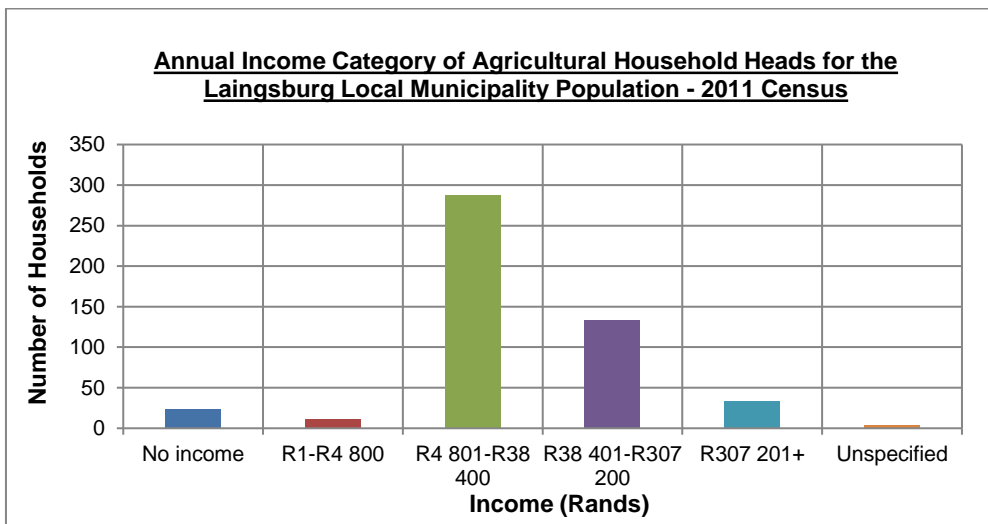


Figure 29: Annual Income Category of Agricultural Household Heads for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).

Figure 30 below shows the number of agricultural households in relation to the type of agricultural activity within the Laingsburg Local Municipality based on the 2011 Census data. It is evident in Figure 30 that the majority of households (345) were involved in livestock production, followed by 246 households for poultry production, 126 households for vegetable production and 102 households for production of other crops (Statistics SA, 2017).

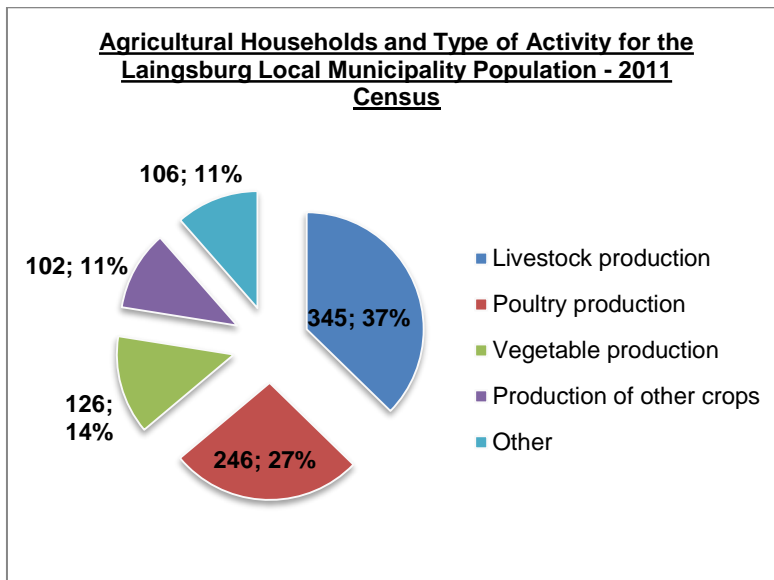


Figure 30: Agricultural Households and Type of Activity for the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).

From the period of 1999 to 2009, the industries of mining, manufacturing, construction and finance displayed a significant contribution for the Central Karoo District Municipality. Within this period, the construction and manufacturing sectors in the Laingsburg Municipality displayed strong growth by 11.8 % and 9.7 %, respectively; however, the agriculture, forestry and fishing sector declined by 1.52 % (Western Cape Government, 2012).

11.4. Level of Education

Northern Cape: Namakwa District Municipality and Karoo Hoogland Local Municipality

Based on the 2011 Census, in terms of education, 5.7 % of the population of the Karoo Hoogland Local Municipality was recorded as having no schooling, 48.1 % with some primary schooling, 7.7 % completed primary school, 24.2 % with some secondary education, 6.2 % completed secondary school and 0.6 % with higher education, as shown in Figure 31 below.

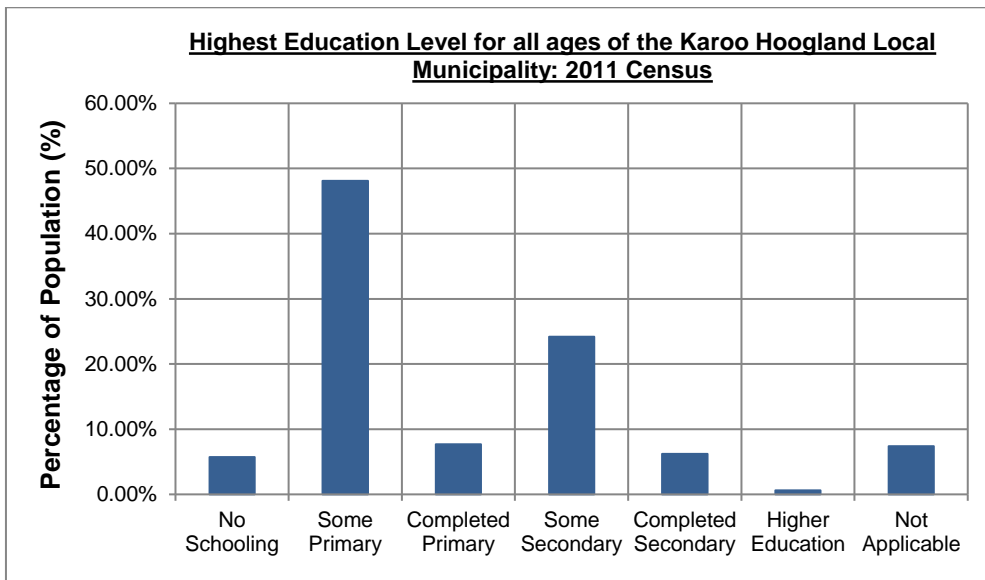


Figure 31: Education Levels of the Karoo Hoogland Local Municipality in 2011 (Statistics SA, 2017).

Western Cape: Central Karoo District Municipality and the Laingsburg Local Municipality

Based on the 2011 Census, in terms of education, 3.8 % of the population of the Laingsburg Local Municipality was recorded as having no schooling, 43.2 % with some primary schooling, 7.8 % completed primary school, 31.8 % has some secondary education, 7.8 % completed secondary school and 1.6 % has higher education, as shown in Figure 32 below.

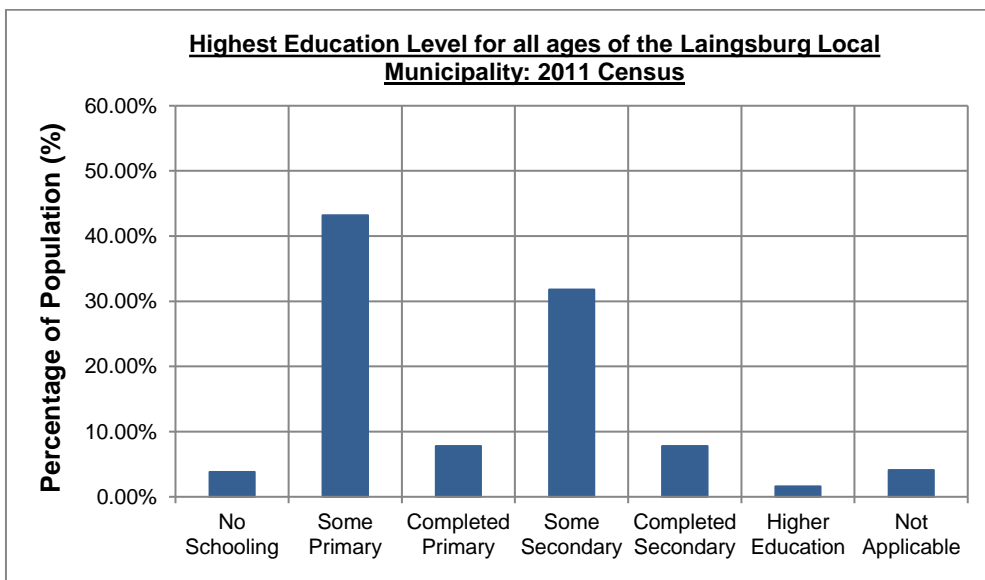


Figure 32: Education Levels of the Laingsburg Local Municipality in 2011 (Statistics SA, 2017).

11.5. Socio-Economic Value of the Proposed Project

Expected capital value of the proposed project on completion	± R 150 million to R 250 million
Expected yearly income that will be generated by or as a result of the proposed project	Not Applicable
Estimated number of new employment opportunities that will be created in the construction phase of the proposed project	Approximately 130
Expected value of the employment opportunities during the construction phase of the proposed project	± R 10 million
Percentage of the value of employment opportunities that will accrue to previously disadvantaged individuals during the construction phase of the proposed project	± 60 %
Estimated number of permanent new employment opportunities that will be created during the operational phase of the proposed project	Eskom Operated
Expected current value of the employment opportunities during the first 10 years during the operational phase of the proposed project	Eskom Operated
Percentage of the value of employment opportunities that will accrue to previously disadvantaged individuals during the operational phase of the proposed project	Eskom Operated

SECTION C: PUBLIC PARTICIPATION

This section provides an overview of the tasks undertaken during the BA Phase, with a particular emphasis on providing a clear record of the PPP followed. The PPP has been undertaken by the CSIR, with assistance from Shawn Johnston of Sustainable Futures ZA, an independent Public Participation Specialist. The PPP is outlined in Figure 33.

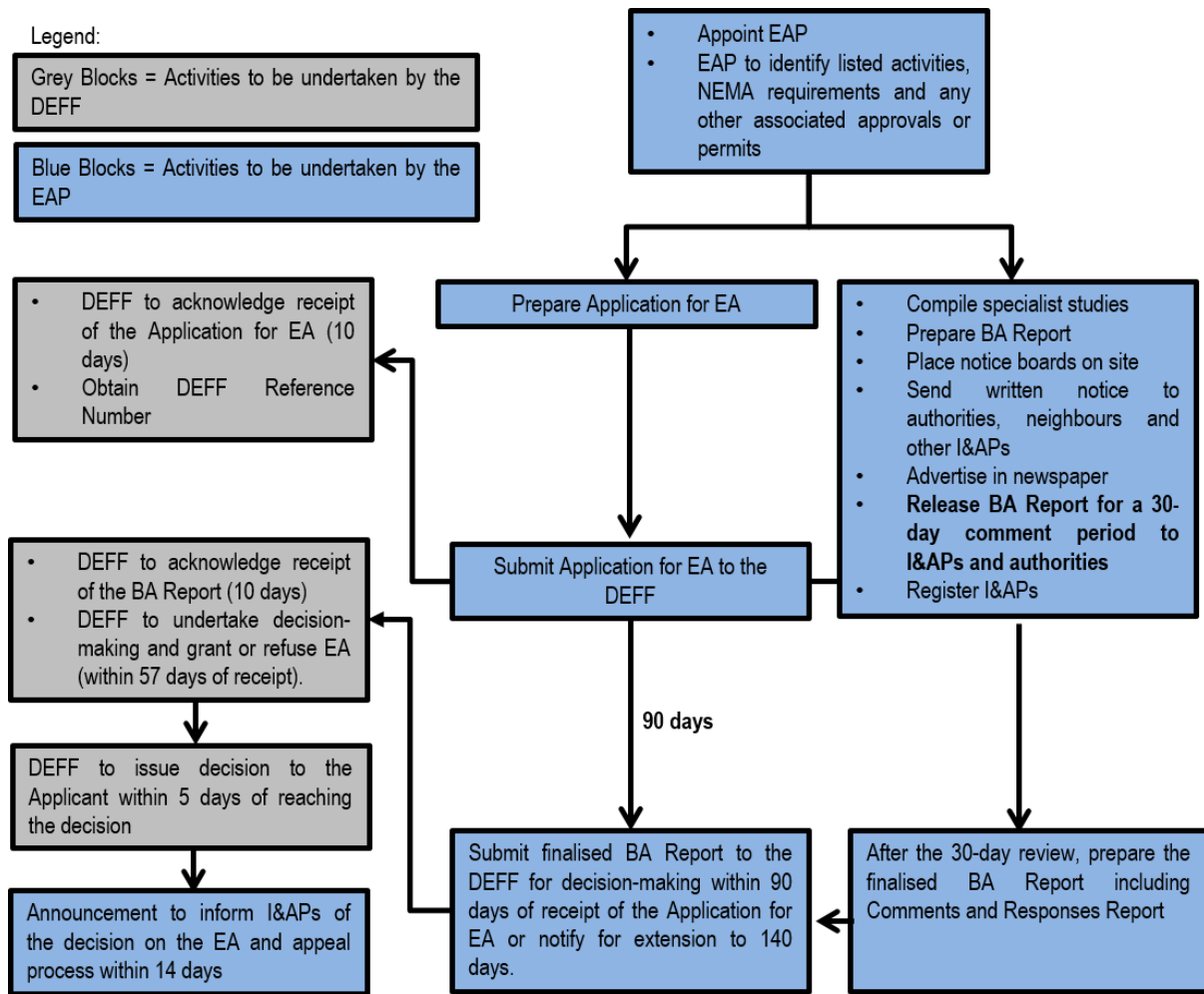


Figure 33: PPP for the Proposed Construction and Operation of EGI to support the Sutherland, Sutherland 2 and Rietrug WEFs Electrical Grid Infrastructure BA Project

1. ADVERTISEMENT AND NOTICE

Newspaper Advertisement:

In order to notify and inform the public of the proposed project and invite I&APs to register on the project database and to comment on the Draft BA Report, the release of the Draft BA Report and BA Process will be advertised in two provincial newspapers and one local newspaper. Specifically, the advertisements will be placed in the Noordwester (local newspaper), the Cape Times and Die Burger (provincial) newspapers. Afrikaans advertisements will be placed in the Noordwester and Die Burger, whilst an English advertisement will be placed in the Cape Times. The newspaper advertisements will provide the details of the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>), as an indication of where information

available on the project can be downloaded from. A copy of the text included in the newspaper advertisements is included in Appendix E.1 of this BA Report. Proof of placement of the newspaper advertisements will be included in Appendix E.1 of the finalised BA Report.

Site Notice Board:

Regulation 41 (2) (a) of the 2014 NEMA EIA Regulations (as amended) requires that a notice board providing information on the project and BA Process is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site. To this end, notice boards were placed at the locations shown in Table 12. A copy of the notice boards and proof of placement thereof is included in Appendix E.1 of this BA Report.

Table 12: Site Notice Boards Placed for the Commencement of the BA Process

Location	Co-ordinates	Language
Laingsburg Local Municipality Office, Western Cape (Municipal Notice Board at the Entrance)	33° 11'51.00''S; 20° 51'30.00''E	Afrikaans and English
Beaufort West Local Municipality Office & Public Library (Municipal Notice Board)	32° 40'16.00''S; 21° 30'49.00''E	Afrikaans and English
Muller General Dealer on Voortrekker Street, Merweville (Shop Entrance)	32° 40'04.00''S; 21° 30'54.00''E	Afrikaans and English
Placed along the proposed 132 kV Power Line Route on Portion 6 of Farm Hamelkraal 16	32° 40'04.00''S; 21° 30'49.00''E	Afrikaans and English
Placed long the proposed 132 kV Power Line Route and MTS site on Portion 7 of Farm Hamelkraal 16	32° 40'46.00''S; 21° 16'26.00''E	Afrikaans and English
Placed along the proposed 400 kV Power Line Route near Remaining Extent of Spitskop Farm 20 (Notice 1)	32° 44'06.00''S; 21° 15'42.00''E	Afrikaans and English
Placed along the proposed 400 kV Power Line Route near Remaining Extent of Spitskop Farm 20 (Notice 2)	32° 44'09.00''S; 21° 15'44.00''E	Afrikaans and English
Merweville - Sutherland Road R356 Gate	32° 32'02.00''S; 20° 58'23.00''E	Afrikaans and English
Sutherland OK Bazaar Mini Market	32° 23'31.35''S; 20° 39'44.19''E	Afrikaans and English
Karoo Hoogland Local Municipality, Sutherland, Northern Cape	32° 23'35.11''S; 20° 39'41.70''E	Afrikaans and English
Sutherland Wind Energy Facility (Entrance)	32° 36'33.38''S; 20° 56'36.70''E	Afrikaans and English
Rietrug Wind Energy Facility (Entrance)	32° 36'09.74''S; 21° 00'36.51''E	Afrikaans and English

2. DETERMINATION OF APPROPRIATE MEASURES

Refer to the section below which provides a detailed outline of the measures taken to include all potential I&APs during the BA Process (as required by Regulation 41(2)(e), 41(6) and 41(2)(b) of GN R326, in terms of the 2014 NEMA EIA Regulations (as amended)).

Proof of emails sent during the Release of Draft BA Report Phase (i.e. for the release of the Draft BA Report, Letter 1 to I&APs, Stakeholders and Organs of State, as well as a Comment and Registration Form) will be included in Appendix E.2 of the finalised BA Report. In terms of Regulation 41(2)(e) of GN R326, at this stage of the assessment process no persons have been identified as desiring but unable to participate in the process. Therefore, no alternative methods have been agreed to by the competent authority.

In line with Regulation 41(2)(b) of GN R326 and prior to the commencement of the BA Process (and advertising the EA Process in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the BA Process. This was supplemented with input from the Sustainable Futures ZA, BA Project Managers (CSIR), and the Project Applicant (Mainstream). Appendix E.4 of this BA Report contains a detailed copy of the I&AP database which indicates interaction with I&APs, key stakeholders and all I&APs registered on the project database during the BA Process.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcement, the identification and registration of I&APs is ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups are expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

In terms of the electronic database, I&AP details are captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the BA Process will remain on the project database throughout the process and will be kept informed of all opportunities to comment and will only be removed from the database by request (it should be noted that to date, no requests to de-register were received by the EAP or Public Participation Specialist).

As noted above, the proposed Electrical Grid Infrastructure traverses five farm portions in the Northern Cape, and seven farm portions in the Western Cape. The landowners of the affected farm properties and adjacent farm properties were identified during the Project Initiation and Release of the Draft BA Report Phase based on the proposed project layout and have been included on the database of I&APs (as included in Appendix E.4). Therefore, written notice has been provided to the occupiers of the site (as shown in Appendix E of this BA Report) (in accordance with Regulation 41 (2) (b) (i) of the 2014 NEMA EIA Regulations (as amended)).

3. APPROACH TO THE PPP

In terms of Regulation 41(6) of GN R326 the section below outlines the PPP for this assessment in order to provide potential I&APs, Stakeholders and Organs of State access to information on the project and the opportunity to comment at the various stages of the assessment process. It should be noted that no deviations from the PPP have been requested.

3.1. Project Initiation and Release of the Draft BA Report Phase

As noted above, the BA Report for the EGI project is currently being released to I&APs for review. The section below summarises the PPP to inform I&APs of the project and to release the BA Report:

- **Database Development and Maintenance:** In line with Regulation 41(2)(b) of GN R326, prior to the commencement of the BA Process and placing the newspaper advertisements (as noted in Section C (1) above), an initial database of potential I&APs was developed for the BA Process. As noted above, while not required by the regulations, all I&APs (and authorities and Organs of State) proactively identified prior to advertising the BA Process will remain on the database for the duration of the assessment process. As comments are received or requests to register interest are received from I&APs during the project, the database is amended to include these I&APs as registered I&APs. A copy of the I&AP database is included in Appendix E.4 of this BA Report.
- **Letter 1 to I&APs to Inform I&APs of the BA Process and Availability of the BA Report:** Written notification to inform I&APs of the BA Project and to inform them of the availability of the BA Report for comment will be sent to all I&APs and Organs of State registered on the project database via Letter 1 via email (where email addresses are available) and via courier (to the Laingsburg Local Municipality, Laingsburg Public Library, Sutherland Public Library, Karoo Hoogland Local Municipality, and Sutherland Farmers Association). The letter will include notification of the proposed project and of the 30-day comment period for the Draft BA Report, as well as a copy of the Comment and Registration Form. Proof of courier waybills and a copy of

the emails sent will be included in Appendix E.2 of the finalised BA Report (which will be submitted to the DEFF for decision-making).

- **Advertisements to Register Interest:** An advertisement will be placed in The Cape Times (Provincial), Die Burger (Provincial) and Die Noordwester (Local) newspapers advertising the BA commencement, release of the Draft BA Report and opportunity to comment. A copy of this advertisement will be included in Appendix E.1 of the finalised BA Report (which will be submitted to the DEFF for decision-making).
- **Site Notice Board:** As noted in Section C (1) above, notice boards were placed for the proposed project. A copy of the notice boards and proof of placement thereof are included in Appendix E.1 of this BA Report.
- **30-Day Comment Period:** As noted above, the potential I&APs, including authorities and Organs of State, will be notified via Letter 1 of the 30-day comment and registration period within which to submit comments on the Draft BA Report and/or to register on the I&AP database.
- **Availability of Information:** The Draft BA Report will be made available and distributed to ensure access to information on the project and to communicate the outcome of specialist studies. Copies of the report will be placed at the Sutherland and Laingsburg local libraries for I&APs and Stakeholders to access for viewing. Key authorities will be provided with either a hard copy and/or CD of the BA Report via courier. The BA Report will also be uploaded to the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>) and telephonic consultations will take place, as necessary.
- **Meetings Held:** A public meeting was not deemed necessary for the proposed project.
- **Comments Received:** A key component of the BA Process is documenting and responding to the comments received from I&APs and the authorities. Copies of all comments received during the review of the Draft BA Report will be included in Appendix E.5 of the finalised BA Report and in the Comments and Response Report (Appendix E.3 of the finalised BA Report). The Comments and Responses Report will indicate the nature of the comment, as well as when and who raised the comment. The comments received will be considered by the BA team and appropriate responses will be provided by the relevant member of the team, Applicant and/or specialist. The response provided will indicate how the comment received has been considered in the BA Reports and in the project design or EMPRs, where and if applicable.
- **Access to Information:** All project information is made available on an easily accessible website: <https://www.csir.co.za/environmental-impact-assessment>

3.2. Compilation of finalised BA Report for Submission to the DEFF

- Following the 30-day commenting period of the Draft BA Report and incorporation of the comments received into the report, the finalised BA Report (i.e. hard copies and electronic copies) will be submitted to the DEFF in line with Regulation 19 (1) (a) of the 2014 NEMA EIA Regulations (as amended). In line with best practice, I&APs on the project database will be notified via email (where email addresses are available) of the submission of the finalised BA Report to the DEFF for decision-making.
- The BA Report that is submitted for decision-making will include proof of the PPP that will be undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the Draft BA Report for the 30-day review (as explained above). To ensure ongoing access to information, copies of the finalised BA Report that will be submitted for decision-making and the Comments and Response Report (detailing comments received during the BA Phase and responses thereto) will be placed on the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>).
- The DEFF will have 57 days (from receipt of the finalised BA Report) to either grant or refuse EA (in line with Government Gazette 41445 in Government Notice 113 of 16 February 2018 (i.e. the Gazetting of the Strategic Transmission Corridors)).

3.3. Environmental Decision-Making

- **Environmental Decision-Making and Appeal Period** - Subsequent to the decision-making phase, if an EA is granted by the DEFF for the proposed project, all registered I&APs, Organs of State and stakeholders on the project database will receive notification of the issuing of the EA and the appeal period. The 2014 NEMA EIA Regulations (as amended) (i.e. Regulation 4 (1)) states that after the Competent Authority has reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the 2014 NEMA EIA Regulations (as amended) stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EA and the appeal procedure and its respective timelines. A letter (i.e. Letter 2) will also be sent via email and/or registered mail (where email addresses are not available) to all registered I&APs, Stakeholders and Organs of State (where postal, physical and email addresses are available) on the database. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EA. A copy of the EA will be uploaded to the project website (i.e. <https://www.csir.co.za/environmental-impact-assessment>). In addition, all I&APs on the project database will be notified of the outcome of the appeal period via email.

4. ISSUES RAISED BY I&APS AND COMMENTS AND RESPONSE REPORT

The comments received during the commenting period on the Draft BA Report will be captured and included in a Comments and Response Report, which will be attached as Appendix E.3 of the finalised BA Report. The Comments and Response Report will include all comments received from I&APs, as well as responses to the comments from the project team.

5. AUTHORITY PARTICIPATION

The current database of potential I&APs, including Authorities and Organs of State, is included in Appendix E.4. Authorities and Organs of State will receive written notification of the proposed activities via email together with all potential I&APs identified for this assessment. The I&AP database included in Appendix E.4 of this BA Report has been divided into Organs of State, Stakeholders (NGOs and Conservation Organisations), Landowners, Adjacent Property Owners and Additional Registered I&APs (based on requests to register). As this project will support a renewable energy project, Eskom and the SKA Project Office are included on the database of Organs of State. Below is a summary of the notification process that will be undertaken as part of the PPP for Authorities:

- **Notification of the BA Report Release Phase:**

All Authorities and Organs of State on the project database will be notified of the 30-day comment period on the Draft BA Report, via Letter 1. Key authorities will be provided with either a hard copy and/or CD of the Draft BA Report via courier. Proof of courier waybills will be included in Appendix E.2 of the finalised BA Report, which will be submitted to the DEFF for decision-making.

Organs of State will also be notified via email (where email addresses are available) of the submission of the finalised BA Report to the DEFF, as well as via post and email (where postal, physical and email addresses are available) of the outcome of the decision-making process.

SECTION D: IMPACT ASSESSMENT

This section includes a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, and decommissioning phase, in line with the requirements of the 2014 NEMA EIA Regulations (as amended).

1. APPROACH TO THE BA: 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 project is well understood so that the impacts associated with the project 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 impacts 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. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The cumulative impacts have been assessed by identifying other renewable energy project proposals and other applicable (and relevant) projects, such as construction and upgrade of electricity generation, and transmission or distribution infrastructure in the local area that have been approved (i.e. positive EA has been issued) or an EA Process is currently underway. This includes an area within 30 - 50 km of the proposed Sutherland, Sutherland 2 and Rietrug WEF Electrical Grid Infrastructure project. The proposed and existing electrical and renewable energy developments that have been considered as part of the BA Phase are provided in Table 13 below and illustrated in Figure 34.

Cumulative effects associated with these similar types of projects include inter alia: traffic generation; avifaunal collisions and mortalities; habitat destruction and fragmentation; loss of agricultural land; removal of vegetation; increase in stormwater run-off and erosion; increase in water requirements; job creation; social upliftment; and upgrade of infrastructure and contribution of renewable energy into the National Grid. In addition to the projects listed below in the table and shown in the figure below, there are also two existing 400 kV Eskom lines that occur south of the proposed project site (one of which will be connected to for the proposed project). These lines run below the escarpment, while the proposed project site is predominantly proposed on the escarpment.

The Renewable Energy Development EIA Database of 2019, Quarter 2 was consulted with and it has been confirmed that no new similar developments have been proposed within the 30 - 50 km radius of the proposed Electrical Grid Infrastructure project.

Table 13: Projects considered as part of the cumulative impact assessment that occur within 30 - 50 km of the site

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
Proposed REF at the Sutherland Site, Western and Northern Cape	Mainstream	DEA Reference Number: 12/12/20/1782 DEA Reference Number: 12/12/20/1782/AM1	Mainstream intended to develop the Sutherland REF, consisting of a Solar Energy Facility and a WEF, with a collective generation capacity (i.e. for wind and solar) of 747 MW to 1137 MW, with 325 turbines on site.	Mainstream accordingly received EA on 22 February 2012 (DEA Reference Number: 12/12/20/1782) from the National DEA to construct and operate the proposed Sutherland REF. Following this, a non-substantive Amended EA, dated 6 October 2015 (DEA Reference Number: 12/12/20/1782/AM1), was issued to Mainstream. Refer to the following rows of this table for the status of this project, as this project has since been replaced.
Proposed 140 MW Sutherland WEF near Sutherland, Northern and Western Cape	Mainstream	DEA Reference Number: 12/12/20/1782/2 DEA Reference Number: 12/12/20/1782/2/AM2	Mainstream intends to develop a 140 MW WEF on several farm portions in the Northern and Western Cape Provinces.	As noted in Section A of this BA Report, on 10 November 2016, the National DEA granted three separate EAs for the Sutherland WEF, Sutherland 2 WEF, and Rietrug WEF (DEA Reference Numbers: 12/12/20/1782/2; 12/12/20/1782/3; and 12/12/20/1782/1). These EAs replace the original EA (dated 22 February 2012) and the amended EA (dated 6 October 2015). The CSIR was appointed by Mainstream to apply for the amendment to split the Sutherland REF into three separate WEFs.
Proposed 140 MW Sutherland 2 WEF near Sutherland, Northern Cape	Mainstream	DEA Reference Number: 12/12/20/1782/3 DEA Reference Number: 12/12/20/1782/3/AM2	Mainstream intends to develop a 140 MW WEF on several farm portions in the Northern Cape Province.	
Proposed 140 MW Rietrug WEF near Sutherland, Northern Cape	Mainstream	DEA Reference Number: 12/12/20/1782/1 DEA Reference Number: 12/12/20/1782/1/AM2	Mainstream intends to develop a 140 MW WEF on several farm portions in the Northern Cape Province.	As part of the approved WEFs, the EAs (dated 10 November 2016) authorised the construction of wind turbines with a hub height of up to 120 m and rotor diameter of up to 120 m. A second amendment application was submitted to the National DEA in February 2017 to increase the hub height and rotor diameter of the turbines from 120 m to up to 150 m. In addition, the authorised layout changed to accommodate the larger turbines. The CSIR was appointed by Mainstream to apply for the amendment to change the turbine hub height and rotor diameter. On 25 August 2017, the National DEA accordingly granted separate EAs for the Sutherland, Sutherland 2, and Rietrug WEFs (DEA Reference Numbers: 12/12/20/1782/2/AM2; 12/12/20/1782/3/AM2; and 12/12/20/1782/1/AM2). The CSIR was further appointed by Mainstream in 2019 to apply for three additional amendments to these EAs. Applications were lodged with the DEFF in August 2019 to further amend the turbine hub height and rotor

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
				diameter, and Project Applicant contact details. The final Amendment Reports will be submitted to the DEFF for consideration within 90 days of submission of the Application Form for Amendment.
BA for the Proposed Construction of Electrical Grid Infrastructure to support the Sutherland WEF, Northern and Western Cape Provinces (Sutherland WEF - Electrical Grid Infrastructure)	Mainstream	DEA Reference Number: 14/12/16/3/3/1/1816	Mainstream intends to develop a 132 KV distribution line and associated Electrical Grid Infrastructure to support the proposed Sutherland WEF. The proposed distribution line will extend from the Sutherland WEF on-site substation to Alternative 1 of the third-party substation (i.e. collector hub) in the Northern Cape.	Mainstream also proposed to construct electrical infrastructure (in order to support each of the abovementioned separately authorised WEFs). These BA Processes were commissioned by the CSIR in 2017 and concluded in 2018. In February 2018, the DEA issued EAs for these three BA Projects. In these BAs, the supporting electrical infrastructure for each WEF consisted of an on-site substation, laydown area, Operations and Maintenance (O&M) Building, a 132 kV distribution line, a service road, and the connection to a proposed third-party substation.
BA for the Proposed Construction of Electrical Grid Infrastructure to support the Sutherland 2 WEF, Northern and Western Cape Provinces (Sutherland 2 WEF - Electrical Grid Infrastructure)	Mainstream	DEA Reference Number: 14/12/16/3/3/1/1814/AM1	Mainstream intends to develop a 132 KV distribution line and associated Electrical Grid Infrastructure to support the proposed Sutherland 2 WEF. The proposed distribution line will extend from the Sutherland 2 WEF on-site substation to Alternative 1 of the third-party substation (i.e. collector hub) in the Northern Cape.	
BA for the Proposed Construction of Electrical Grid Infrastructure to support the Rietrug WEF, Northern and Western Cape Provinces (Rietrug WEF - Electrical Grid Infrastructure)	Mainstream	DEA Reference Number: 14/12/16/3/3/1/1815	Mainstream intends to develop a 132 KV distribution line and associated Electrical Grid Infrastructure to support the proposed Rietrug WEF. The proposed distribution line will extend from the Rietrug WEF on-site substation to Alternative 1 of the third-party substation (i.e. collector hub) in the Northern Cape.	
BA for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2, and Rietrug WEFs, Northern and Western Cape Provinces	Mainstream	Pending	Mainstream wishes to undertake a separate BA Process in order to connect the abovementioned Sutherland, Sutherland 2 and Rietrug WEFs to the National Grid. Mainstream is therefore proposing the development of a 132 kV power line, a MTS, a 400 kV power line, and associated service roads within the REDZ: 2 Komsberg and Central Power Corridor.	Two alternative routings of the power line were assessed in the above three BA Processes (DEA Reference Number: 14/12/16/3/3/1/1816; DEA Reference Number: 14/12/16/3/3/1/1814/AM1; DEA Reference Number: 14/12/16/3/3/1/1815). However Alternative 1 was approved in the EA. Both Alternative 1 and Alternative 2 did not present any environmental fatal flaws and were deemed acceptable, feasible and suitable. Mainstream therefore wishes to apply for EA to approve the previously assessed Alternative 2 132 kV power line routing, as well as service roads, a MTS and 400 kV power line (as described in Section A of this BA Report). The Draft BA Report is currently being released for comment.

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
Proposed Suurplaat WEF and Associated Infrastructure on a site near Sutherland, Western Cape and Northern Cape Provinces	Moyeng Energy (PTY) Ltd	DEA Reference Number: 12/12/20/1583 DEA Reference Number: 12/12/20/1583/AM1 DEA Reference Number: 12/12/20/1583/AM2 DEA Reference Number: 12/12/20/1583/AM3	Moyeng Energy (PTY) Ltd intends to develop a WEF on several farm portions in the Northern and Western Cape Provinces.	Moyeng Energy (PTY) Ltd received EA for the Suurplaat WEF on 5 April 2011 (DEA Reference Number: 12/12/20/1583). The EIA included a separate assessment of the three phases of the WEF, transmission lines and substations (Savannah Environmental, 2016), however a single EIA Process was followed and a single EA was received. An Amended EA was issued by the National DEA on 26 March 2014 (DEA Reference Number: 12/12/20/1583/AM1) and 1 February 2016 (DEA Reference Number: 12/12/20/1583/AM2), for a change to applicant details and extension of the validity period. It is understood that Moyeng Energy (PTY) Ltd is undertaking an Application for EA Amendment to split the approved Moyeng Energy (PTY) Ltd Suurplaat WEF EIA project into four separate EAs (DEA Reference Number: 12/12/20/1583/AM3): <ul style="list-style-type: none"> ▪ Proposed Suurplaat WEF and Associated Infrastructure: Suurplaat Phase ▪ Proposed Suurplaat WEF and Associated Infrastructure: Gemini Phase ▪ Proposed Suurplaat WEF and Associated Infrastructure: Klipfontein Phase ▪ Proposed Suurplaat WEF and Associated Infrastructure: Grid Connection Phase
Proposed construction of the 750 MW Roggeveld Wind Farm within the Karoo Hoogland Local Municipality of the Northern Cape Province and within the Laingsburg Local Municipality of the Western Cape Province	G7 Renewable Energies (PTY) Ltd and Roggeveld Wind Power (PTY) Ltd	DEA Reference Number: 12/12/20/1988 DEA Reference Number: 12/12/20/1988/1	G7 Renewable Energies (PTY) Ltd intends to develop a 750 MW WEF on several farm portions in the Northern and Western Cape Provinces.	The project received an EA (DEA Reference Number: 12/12/20/1988) on 21 May 2013 for the 750 MW Wind Farm. However, the project is being split into three phases. Phase 1 included a separate EIA Process, which obtained EA (DEA Reference Number: 12/12/20/1988/1) on 12 August 2014 to establish a 140MW WEF and associated infrastructure within the Northern Cape and Western Cape. The Roggeveld Wind Farm was awarded Preferred Bidder status in May 2015 in terms of the REIPPPP.
Proposed PV Solar Energy Facility on a site south of Sutherland, within the Karoo Hoogland Local Municipality of the Namakwa District Municipality, Northern Cape Province	Inca Sutherland Solar (PTY) Ltd	DEA Reference Number: 12/12/20/2235	Inca Sutherland Solar (PTY) Ltd is proposing to develop a 10 MW Solar Energy Facility on the farm Jakhals Valley (99), approximately 11 km south of Sutherland, in the Karoo Hoogland Local Municipality, Northern Cape Province.	The project received an EA on 8 February 2012.

Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces: BASIC ASSESSMENT REPORT

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
Proposed Hidden Valley WEF Northern Cape	Hidden Valley Wind - African Clean Energy Developments (PTY) Ltd (ACED Renewables Hidden Valley)	DEA Reference Number: 12/12/20/2370/1	ACED Renewables Hidden Valley is proposing to develop a 150 MW WEF in the Northern Cape Province.	The project received an EA on 13 May 2013.
Proposed Hidden Valley WEF Northern Cape	Hidden Valley Wind - African Clean Energy Developments (PTY) Ltd (ACED Renewables Hidden Valley)	DEA Reference Number: 12/12/20/2370/2	ACED Renewables Hidden Valley is proposing to develop a 150 MW WEF in the Northern Cape Province.	The project received an EA on 12 August 2014.
Proposed Hidden Valley WEF Northern Cape	Hidden Valley Wind - African Clean Energy Developments (PTY) Ltd (ACED Renewables Hidden Valley)	DEA Reference Number: 12/12/20/2370/3	ACED Renewables Hidden Valley is proposing to develop a 150 MW WEF in the Northern Cape Province.	The project received an EA on 12 August 2014.
Proposed Renewable Gunsfontein Energy Facility WEF, Northern Cape	Networx Renewables (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/2/399	Networx Renewables (PTY) Ltd is proposing to develop a 280 MW WEF in the Northern Cape.	The Final Scoping Report was submitted to the DEA in November 2013.
Proposed Renewable Gunsfontein Energy Facility, Solar Energy Facility, Northern Cape	Networx Renewables (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/2/395	Networx Renewables (PTY) Ltd is proposing to develop a 150 MW Solar Energy Facility in the Northern Cape.	The Final Scoping Report was submitted to the DEA in November 2013.
Proposed Renewable Gunsfontein Energy Facility, 132 kV Power Lines, Northern Cape	Networx Renewables (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/1/910	Networx Renewables (PTY) Ltd is proposing to develop 132 kV power lines to support the proposed Renewable Gunsfontein Energy Facility in the Northern Cape.	The Final Scoping Report was submitted to the DEA in November 2013.
Proposed Renewable Gunsfontein Energy Facility, 400 kV Substation, Northern Cape	Networx Renewables (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/2/554	Networx Renewables (PTY) Ltd is proposing to develop a 400 kV substation to support the proposed Renewable Gunsfontein Energy Facility in the Northern Cape.	The Final Scoping Report was submitted to the DEA in November 2013.
Proposed Gunstfontein Wind Farm near Sutherland, Northern Cape Province	Gunstfontein Wind Farm (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/2/826	Gunstfontein Wind Farm (PTY) Ltd is proposing to construct the Gunstfontein WEF and bid it in the subsequent round of the REIPPPP.	The Draft EIA Report was made available for public review in February 2016.
Proposed Gunstfontein Switching Station, 132kV overhead power line and ancillary infrastructure for the proposed Gunstfontein Wind Farm near Sutherland, Northern Cape Province	Gunstfontein Wind Farm (PTY) Ltd	Unknown	Gunstfontein Wind Farm (PTY) Ltd is proposing to bid the proposed Gunstfontein WEF in the subsequent round of the REIPPPP. In order to connect the proposed Gunstfontein WEF to the national grid, supporting electrical infrastructure will be required, such as a switching station, 132 kV power line, and ancillary	The BA Report was made available for public review from 21 July 2016 to 22 August 2016.

Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces: BASIC ASSESSMENT REPORT

Project Name	Applicant	DEA Reference Number	Brief project description	Phase
			infrastructure.	
Proposed Esizayo Wind Energy Facility near Laingsburg, Western Cape	BioTherm Energy (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/967	BioTherm Energy (PTY) Ltd is proposing to construct a 250 MW WEF approximately 30 km Northeast of Laingsburg in the Western Cape.	The Draft EIA Report was released to the public for comment in February 2017.
Proposed Maralla East Wind Energy Facility near Sutherland, Northern and Western Cape	BioTherm Energy (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/962	BioTherm Energy (PTY) Ltd is proposing to construct a 250 MW WEF approximately 34 km South of Sutherland in the Northern and Western Cape	The Draft EIA Report was released to the public for comment in February 2017.
Proposed Maralla West Wind Energy Facility near Sutherland, Northern Cape	BioTherm Energy (Pty) Ltd	DEA Reference Number: 14/12/16/3/3/2/963	BioTherm Energy (PTY) Ltd is proposing to construct a 250 MW WEF approximately 34 km South of Sutherland in the Northern and Western Cape	The Draft EIA Report was released to the public for comment in February 2017.
Proposed Komsberg West Grid Connection (Power Line and Switching Station), Western and Northern Cape Provinces, and the associated Komsberg West WEF	Komsberg Wind Farms (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/1/1562	Komsberg Wind Farms (Pty) Ltd is proposing the establishment of an overhead power line which will form the grid connection for the proposed Komsberg West WEF in the Western and Northern Cape Provinces.	The proposed project received EA in September 2016.
Proposed Komsberg East Grid Connection (Power Line and Switching Station), Western and Northern Cape Provinces, and the associated Komsberg East WEF	Komsberg Wind Farms (PTY) Ltd	DEA Reference Number: 14/12/16/3/3/1/1561	Komsberg Wind Farms (Pty) Ltd is proposing the establishment of an overhead power line which will form the grid connection for the proposed Komsberg East WEF in the Western and Northern Cape Provinces.	The proposed project received EA in September 2016.

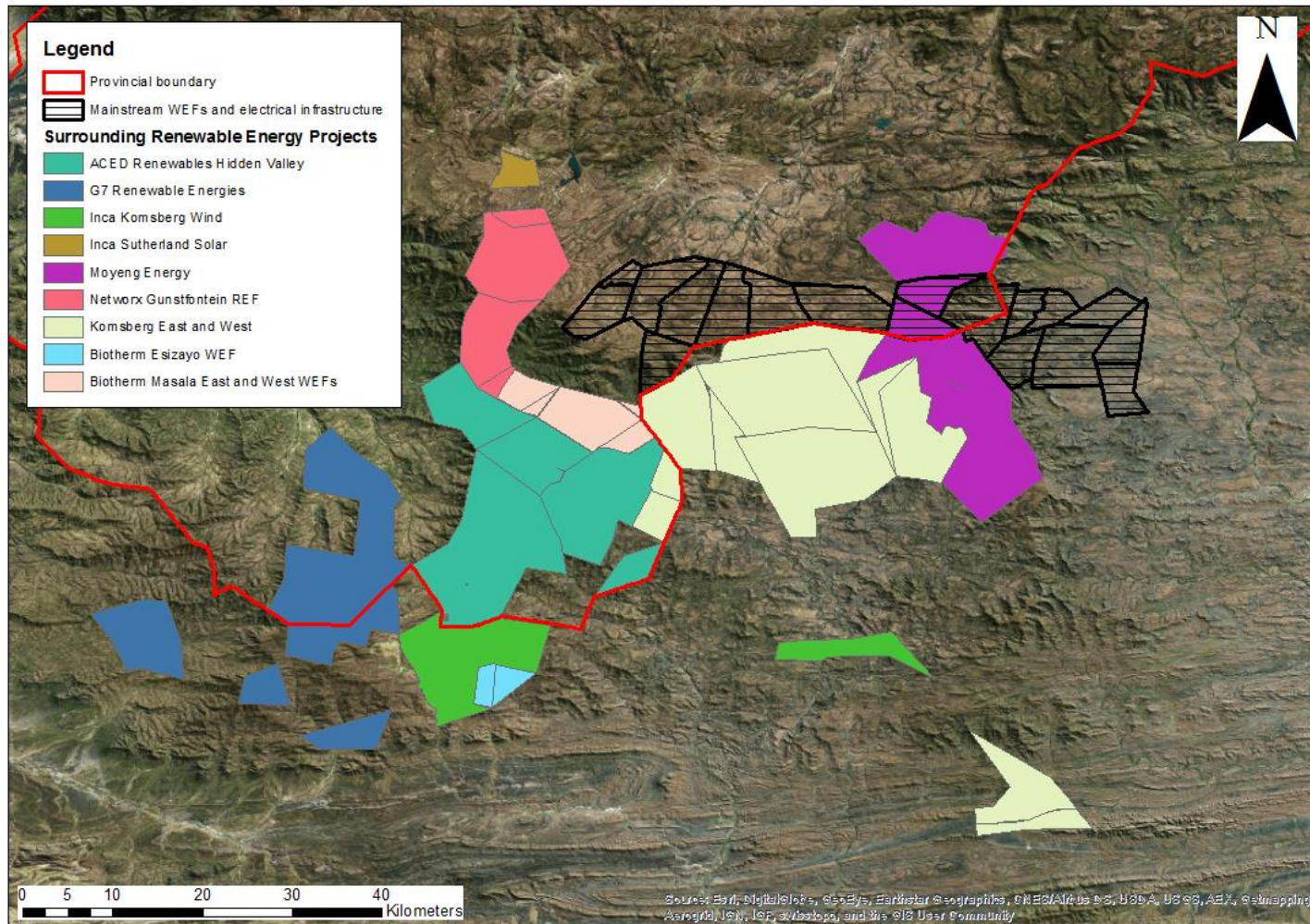


Figure 34: Map of proposed Renewable Energy and Electrical Infrastructure projects considered for the Cumulative Impact Assessment

In addition to the above, the impact assessment methodology includes the following aspects:

Nature of impact/risk - The type of effect that a proposed activity will have on the environment.

Status - Whether the impact/risk on the overall environment will be:

- Positive - environment overall will benefit from the impact/risk;
- Negative - environment overall will be adversely affected by the impact/risk; or
- Neutral - environment overall not be affected.

Spatial extent - The size of the area that will be affected by the impact/risk:

- Site specific;
- Local (<10 km from site);
- Regional (<100 km of site);
- National; or
- International (e.g. Greenhouse Gas emissions or migrant birds).

Duration - The timeframe during which the impact/risk will be experienced:

- Very short term (instantaneous);
- Short term (less than 1 year);
- Medium term (1 to 10 years);
- Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).

Consequence - The anticipated consequence of the risk/impact:

- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).

Reversibility of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):

- High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);
- Moderate reversibility of impacts;
- Low reversibility of impacts; or
- Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).

Irreplaceability of Receiving Environment/Resource Loss caused by impacts/risks - the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

Using the criteria above, the impacts are further assessed in terms of the following:

Probability - The probability of the impact/risk occurring:

- Extremely unlikely (little to no chance of occurring);
- Very unlikely (<30% chance of occurring);
- Unlikely (30-50% chance of occurring)
- Likely (51 - 90% chance of occurring); or
- Very Likely (>90% chance of occurring regardless of prevention measures).

To determine the significance of the identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure 35). This approach incorporates internationally recognised methods from the Intergovernmental Panel on Climate Change (IPCC) (2014) assessment of the effects of climate change and is based on an interpretation of existing information in relation to the proposed activity, to generate an integrated picture of the risks related to a specified activity in a given location, with and without mitigation. Risk is assessed for each significant stressor (e.g. physical disturbance), on each different type of receiving entity (e.g. the municipal capacity, a sensitive wetland), qualitatively (very low, low, moderate, high, and very high) against a predefined set of criteria (i.e. probability and consequence) as indicated in Figure 35:

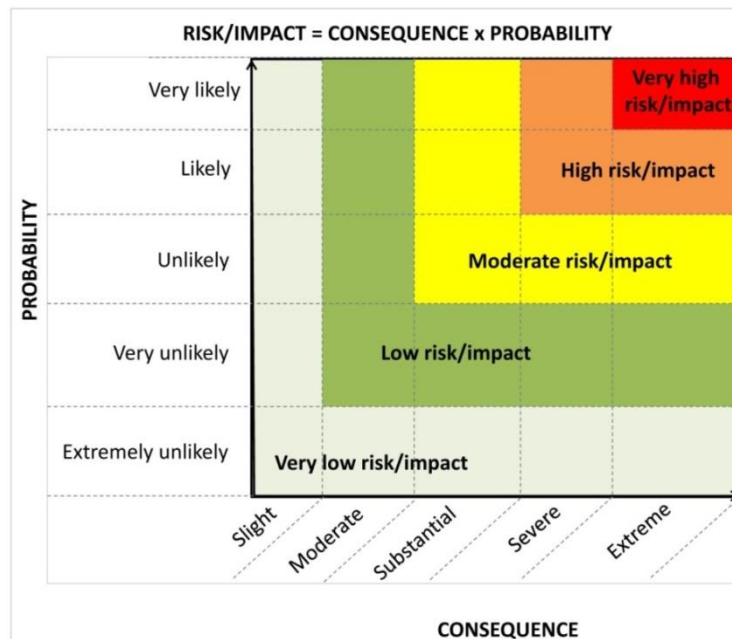


Figure 35: Guide to assessing risk/impact significance as a result of consequence and probability.

Significance - Will the impact cause a notable alteration of the environment?

- Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
- High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and

- Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).

With the implementation of mitigation measures, the residual impacts/risks will be ranked as follows in terms of significance (based on Figure 35):

- Very low = 5;
- Low = 4;
- Moderate = 3;
- High = 2; and
- Very high = 1.

Confidence - The degree of confidence in predictions based on available information and specialist knowledge:

- Low;
- Medium; or
- High.

Impacts have been collated into the Site Specific EMPr (Appendix F of the BA Report) and these include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements (as applicable). This includes a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this is stated.
- Positive impacts and augmentation measures have been identified to potentially enhance positive impacts where possible.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts are evaluated for the construction and operational phases of the development, as well as the decommissioning phase, as applicable. The assessment of impacts for the decommissioning phase is brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts have been evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation has, where possible, taken into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area (as described above and in Table 13); and
- The impact assessment attempts to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

2. POTENTIAL IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

The issues and impacts presented in this Section have been identified via the environmental status quo of the receiving environment (environmental, social and heritage features present on site - as discussed in Section B of this BA Report) and input from specialists that form part of the project team. The specialist studies undertaken to inform this BA has been summarised in this section. It should be noted that unless otherwise stated, impacts identified, and their associated significance are deemed to be negative.

Refer to Appendix D of this BA Report, which includes the complete Specialist Studies undertaken (including the Terms of Reference for each study), which also include feedback on environmental sensitivities and complete impact assessment tables. The proposed mitigation measures and management actions have been carried over to the Project Specific EMP (included in Appendix F of this BA Report).

A list of the specialist studies undertaken, as well as the appointed specialists, are described in Section A of this BA Report. The expertise of the relevant specialists are included in each specialist chapter included in Appendix D of this BA Report, together with declarations of interest (which are also included in Appendix H of this BA Report).

2.1. TERRESTRIAL ECOLOGY IMPACT ASSESSMENT

The Terrestrial Ecology Impact Assessment (Flora and Fauna) was undertaken by Simon Todd of 3Foxes Biodiversity Solutions and is included in Appendix D.1 of this BA Report (Todd, 2019).

The purpose of the Terrestrial Ecology Impact Assessment is to:

- describe and detail the ecological features of the proposed grid connection;
- provide an assessment of the ecological sensitivity of the site;
- identify the likely impacts associated with the development of the grid connection and substation; and
- provide recommendations or mitigation measures to avoid or reduce potential negative environmental impacts.

2.1.1. APPROACH AND METHODOLOGY

A detailed site visit as well as a desktop review of the available ecological information for the area was conducted in order to identify and characterise the ecological features of the site. This allowed for a description of the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc. Patterns are also described in terms of communities, systems, species and fauna. A description of the affected environment is included in Section B of this BA Report.

2.1.2. PROJECT ASPECTS RELEVANT TO TERRESTRIAL ECOLOGICAL IMPACTS

The 132 kV line would have a generally low terrestrial impact as the footprint of each pylon would be relatively small. However, the line also traverses several steep areas where the risk of erosion damage would be high and specific measures to limit erosion potential would need to be implemented.

The transmission substation has a relatively small total footprint but would result in a high local impact as the entire substation footprint would need to be cleared and levelled.

The final section of the power line to link the substation to the Eskom grid would be a 400 kV line which would have a significantly bigger footprint per pylon but as this section of the line would only be 4 km and the spacing of the pylons would be more than for the 132 kV line, the overall footprint would also be small. In addition, the 400 kV power line route is relatively flat and as such, the risk of secondary impact from erosion would be low.

Overall, the major source of impact from the development for fauna and flora would predominantly be habitat loss and disturbance associated with the construction phase of the development. Scope for long-term impact associated with the operational phase of the development would be relatively low and provided that mitigation in the construction phase is effectively applied, there would be little scope for interaction or long term impact associated with the power line and substation infrastructure.

2.1.3. POTENTIAL TERRESTRIAL ECOLOGICAL IMPACTS

The following potential direct terrestrial ecological impacts associated with the proposed Electrical Grid Infrastructure development have been identified:

- **Construction Phase:**
 - Habitat loss and impact on plant SCC as a result of clearing of vegetation;
 - Impact on fauna due to habitat loss and disturbance, as a result of increased levels of noise, pollution, disturbance and human presence; and
 - Habitat loss within Critical Biodiversity Areas as a result of clearing of vegetation and construction phase disturbance.
- **Operational Phase:**
 - Impact on fauna as a result of operational phase activities; and
 - Increased soil erosion during operations due to construction phase disturbance (following the completion of the construction phase), as well as maintenance activities.
- **Decommissioning Phase:**
 - Impact on fauna as a result of increased levels of noise, pollution, disturbance and human presence during decommissioning activities;
 - Increased soil erosion due to decommissioning disturbance; and
 - Increased alien plant invasion due to decommissioning phase disturbance.

The following cumulative impact was also identified:

- Increased habitat loss and fragmentation for fauna, and a decrease in conservation value and future conservation options for the affected areas as a result of the cumulative presence and operation of developments in the surrounding area.

2.1.4. IMPACT ASSESSMENT SUMMARY - TERRESTRIAL ECOLOGY

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase					
Habitat loss and impact on plant SCC as a result of clearing of vegetation	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Minimise development of infrastructure within identified Very High sensitivity areas. ▪ Pre-construction walk-through of the development footprint to be undertaken to locate and identify protected species within the development footprint. All relevant clearing or translocation permits must be obtained before construction starts. ▪ Pre-construction environmental induction for all construction staff on site must be undertaken to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. ▪ Environmental Control Officer (ECO) to provide supervision and oversight of vegetation clearing activities. ▪ All cleared areas that are not under hard infrastructure will need to be rehabilitated with locally occurring species. ▪ All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the construction area. ▪ Temporary lay-down areas should be located within previously transformed areas or areas that have been identified as being of low sensitivity. These areas should be rehabilitated after use. 	Moderate
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Very likely			
	Reversibility	Low			
	Irreplaceability	Low			
Impact on fauna due to habitat loss and disturbance, as a result of increased levels of noise, pollution, disturbance and human presence	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Minimise the development footprint within areas of high fauna importance such as rocky outcrops and drainage lines. ▪ Search and rescue to be undertaken for reptiles and other vulnerable species during construction, before areas are cleared. ▪ Any fauna threatened by the construction activities should be moved to safety by the appointed ECO or appropriately qualified environmental officer. ▪ All construction vehicles should adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises. ▪ All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Probability	Very likely		<ul style="list-style-type: none"> If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are standing open should have places where there are soil ramps allowing fauna to escape the trench. No electrical fencing to be constructed within 30 cm of the ground as tortoises become stuck against such fences and are electrocuted. Limit access to the site and ensure that construction staff and machinery remain within the demarcated construction areas during the construction phase. Environmental induction for all staff and contractors on-site. 	
	Reversibility	High			
	Irreplaceability	Low			
Habitat loss within Critical Biodiversity Areas as a result of clearing of vegetation and construction phase disturbance	Status	Negative	Moderate	<ul style="list-style-type: none"> Minimise the development footprint within the areas of CBA as much as possible and ensure that any disturbed areas are rehabilitated after construction. The final location of the pylons should be checked in the field before construction during the final walk-through of the power line to ensure that these are positioned to minimise the impact of the power line on species and habitats of conservation concern. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Low			
Operational Phase					
Impact on fauna as a result of operational phase activities and disturbance	Status	Negative	Low	<ul style="list-style-type: none"> No electrical fencing to be installed within 30 cm of the ground as tortoises become stuck against such fences and are electrocuted. Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. If any parts of the site must be lit at night for security purposes, this should be done with downward-directed low-UV type lights (such as most LEDs) as far as possible, which do not attract insects. All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Low			
Increased soil erosion during operations due to construction phase disturbance and maintenance activities	Status	Negative	Low	<ul style="list-style-type: none"> Use of geotextiles and other active rehabilitation measures during and after construction to limit soil loss and movement at the site. There should be regular (at least annual) monitoring for erosion throughout the operational period and any problems detected should be 	Low
	Extent	Local			
	Duration	Long Term			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Consequence	Moderate		addressed through the implementation of erosion control measures. <ul style="list-style-type: none"> All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. All disturbed and cleared areas should be revegetated with indigenous perennial shrubs, grasses and succulents from the local area. 	
	Probability	Very likely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Decommissioning Phase					
Impact on fauna as a result of increased levels of noise, pollution, disturbance and human presence during decommissioning activities	Status	Negative	Low	<ul style="list-style-type: none"> Any potentially dangerous fauna such as snakes or fauna threatened by the decommissioning activities should be removed to a safe location prior to the commencement of decommissioning activities. All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. No excavated holes or trenches should be left open for extended periods as fauna may fall in and become trapped. All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact, however, this should be in accordance with the facilities' decommissioning and recycling plan, and as per the agreements with the land owners concerned. All cleared and disturbed areas should be rehabilitated with locally occurring perennial species. 	Low
	Extent	Local			
	Duration	Short Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Low			
Increased soil erosion due to decommissioning disturbance	Status	Negative	Low	<ul style="list-style-type: none"> Use of geotextiles and other active rehabilitation measures during and after construction to limit soil loss and movement at the site. There should be regular monitoring for erosion for at least 5 years after decommissioning by the applicant or appointed entity to ensure that no erosion problems develop as a result of the disturbance, and if they do, to immediately implement erosion control measures. All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	Moderate			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Irreplaceability	Low		<ul style="list-style-type: none"> All disturbed and cleared areas should be revegetated with indigenous perennial shrubs, grasses and succulents from the local area. 	
Increased alien plant invasion due to decommissioning phase disturbance	Status	Negative	Low	<ul style="list-style-type: none"> Alien management plan to be implemented during the decommissioning phase of the development, which makes provision for regular alien clearing and monitoring for at least 5 years after decommissioning. Active rehabilitation and revegetation of previously disturbed areas with indigenous species selected from the local environment. Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after decommissioning activities are complete to encourage natural regeneration of the local indigenous species. Due to the disturbance at the site, alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned. Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning or until alien invasive species are no longer a problem. Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Cumulative Impacts					
Increased habitat loss and fragmentation for fauna, and a decrease in conservation value and future conservation options for the affected areas as a result of the cumulative presence and operation of developments in the surrounding area	Status	Negative	Low	<ul style="list-style-type: none"> Minimise the development footprint as far as possible and ensure that the management plans for the development are optimally implemented during the operational phase of the development to ensure that the indirect impacts associated with the development are kept to a minimum. 	Low
	Extent	Regional			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Low			

2.1.5. CONCLUDING IMPACT STATEMENT - TERRESTRIAL ECOLOGY

The proposed grid connection, substation and associated infrastructure are considered acceptable and would generate **low significance** post-mitigation impacts on terrestrial fauna and flora. There are no specific long-term impacts likely to be associated with the proposed project that cannot be reduced to a low significance. The contribution of the power line and substation components to cumulative impact in the area would be low and is considered acceptable. As such, there are **no fatal flaws** associated with the development and no terrestrial ecological considerations that should prevent it from proceeding (Todd, 2019).

2.2. AQUATIC ECOLOGY IMPACT ASSESSMENT

The Aquatic Ecology Impact Assessment was undertaken by Antonia Belcher and Dana Grobler of BlueScience (Pty) Ltd and is included in Appendix D.2 of this BA Report (BlueScience (PTY) Ltd, 2019).

2.2.1. APPROACH AND METHODOLOGY

The Aquatic Ecology Impact Assessment was informed by a combination of desktop assessments of existing freshwater ecosystem information for the study area and surrounding catchments, as well as by a more detailed assessment of the freshwater features on the various farm portions that comprise the study area. In addition, a site visit was undertaken in May 2019. During the field visits, the characterisation and integrity assessments of the freshwater features were undertaken. Mapping of the freshwater features was undertaken using a GPS Tracker and mapped in PlanetGIS and Google Earth Professional.

A description of the affected environment is included in Section B of this BA Report.

2.2.2. PROJECT ASPECTS RELEVANT TO AQUATIC ECOLOGICAL IMPACTS

The proposed development is located primarily in the upper reaches of the Dwyka River, a tributary in the Gouritz River System in the Southern Coast of South Africa. The Gouritz Water Management Area (WMA) lies within the management area of the Breede Gouritz Catchment Management Agency (BGCMA). The western extent of the proposed 132 kV transmission line is located in the upper reaches of the Riet River, which is a smaller tributary of the lower Orange River System that lies within the management area of the Northern Cape Regional office of the Department of Human Settlements, Water and Sanitation (DHSWS).

Activities and infrastructure associated with the proposed development in relation to Aquatic Ecology and Ecosystems include:

- Major transmission substation that will be placed within some smaller ephemeral tributaries of the Juk River, a tributary of the Dwyka River;
- Overhead 132 kV transmission line that will need to span the upper reaches of the Dwyka and Riet Rivers;
- Overhead 400 kV transmission line that will span the upper reaches of the Juk River; and
- Service roads (jeep track) below the lines that will need to cross the watercourses associated with the upper reaches of the Dwyka and Riet Rivers.

The above-mentioned structures would be in place for the operational phase of the project and could potentially impact on aquatic features over the longer term.

2.2.3. POTENTIAL AQUATIC ECOLOGICAL IMPACTS

The following potential aquatic ecological impacts associated with the proposed Electrical Grid Infrastructure development have been identified:

- Construction Phase
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat as a result of construction activities in or adjacent to aquatic features for the substation, transmission line and service road construction.
 - Indirect Impacts:
 - Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems (i.e. construction activities for the substation, transmission line and service road construction).
- Operational Phase
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat and modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems.
 - Indirect Impacts:
 - Invasive alien plant growth in riparian zones and potential for erosion of watercourses due to the disturbance of aquatic habitat and modification of runoff characteristics.
- Decommissioning Phase
 - Direct Impacts:
 - Disturbance and loss of aquatic habitat as a result of decommissioning activities in or adjacent to aquatic features for the substation, transmission line and service road construction.
 - Indirect Impacts:
 - Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems.
 - Invasive alien plant growth and potential for erosion of watercourses due to the disturbance of aquatic vegetation.

The following cumulative impact was also identified:

- Cumulative impact of the proposed projects on freshwater ecosystems including disturbance activities within watercourses of the area; use of water and possible modification and contamination of runoff.

2.2.4. IMPACT ASSESSMENT SUMMARY - AQUATIC ECOLOGY

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase - Direct Impact					
Disturbance and loss of aquatic habitat as a result of construction activities in or adjacent to aquatic features for the substation, transmission line and service road construction	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Limit disturbance of watercourses through avoiding recommended buffers and utilising existing disturbed areas. ▪ A buffer of at least 32 m between the delineated aquatic ecosystems to the north of the substation footprint and the substation should be maintained. The final location of the substation should be orientated such that it minimises the loss of aquatic habitat as far as possible. Runoff associated with the minor watercourses within the site will need to be diverted around the substation. ▪ Any indigenous vegetation clearing within or adjacent to the watercourses should be prevented as far as possible to minimise erosion within the watercourses. The cleared and disturbed areas surrounding the substation should be rehabilitated as far as possible with revegetation of cleared areas with local indigenous vegetation if necessary. An ECO or an appropriate specialist with knowledge and experience of the local flora be appointed during the construction phase to be able to make clear recommendations with regards to the revegetation of disturbed areas. ▪ During the construction phase, site management must be undertaken at the laydown and construction areas. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during the construction activities such as hydrocarbon spills. Any stormwater that does arise within the construction site must be handled in a suitable manner to trap sediments and reduce flow velocities. ▪ The existing road infrastructure should be utilised as far as possible to minimise the overall disturbance created by the proposed works. Where access routes need to be constructed through the watercourses, the disturbance of the channels should be limited. Wetland areas should be avoided and any road adjacent to a wetland feature should also remain outside of the 50m buffer zone. ▪ All crossings over watercourses should be such that the flow within the drainage channel is not impeded and should be constructed perpendicular to the river channel. Road infrastructure and location of the transmission line pylons should coincide as far as possible to minimise the impact. Any 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	Moderate to Low			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Irreplaceability	Low		disturbed areas should be rehabilitated and monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth.	
Construction Phase - Indirect Impact					
Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems (i.e. construction activities for the substation, transmission line and service road construction)	Status	Negative	Moderate - Low	<ul style="list-style-type: none"> During the construction phase, site management must be undertaken at the laydown and construction areas. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during the construction activities such as hydrocarbon spills. Any stormwater that does arise within the construction site must be handled in a suitable manner to trap sediments and reduce flow velocities. All crossings over watercourses should be such that the flow within the drainage channel is not impeded and should be constructed perpendicular to the river channel. Road infrastructure and location of the transmission line pylons should coincide as far as possible to minimise the impact. Any disturbed areas should be rehabilitated and monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth. 	Low - Very Low
	Extent	Local			
	Duration	Short Term			
	Consequence	Substantial - Moderate			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Moderate			
Operational Phase - Direct Impacts					
Disturbance and loss of aquatic habitat and modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems	Status	Negative	Moderate	<ul style="list-style-type: none"> Limit disturbance to project areas that are outside of watercourses and buffers. A stormwater management plan should be compiled for the compacted surfaces within the site by the project engineer with input from the freshwater specialist. The plan should aim to reduce the intensity of runoff particularly on the steeper slopes and reduce the intensity of the discharge into the adjacent drainage lines. Where necessary measures to dissipate flow intensity or protect erosion should be included in the plan. Adjacent to wetland areas, the plan should encourage infiltration rather than runoff and should prevent the impedance of surface or sub-surface flows. The plan should also mitigate any contaminated runoff from the construction and operation activities from being discharged into any of the aquatic features within the site. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	Medium to Low			
	Irreplaceability	Moderate			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Operational Phase - Indirect Impacts					
Invasive alien plant growth in riparian zones and potential for erosion of watercourses due to the disturbance of aquatic habitat and modification of runoff characteristics	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Monitoring and clearing alien vegetation; and mitigation of erosion on steeper slopes. ▪ Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants. ▪ Storm water run-off from the footprint of the substation should be mitigated, both in terms of the flow and water quality leaving the hardened areas within the substation. No stormwater runoff must be allowed to discharge directly into the watercourses. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate channels and swales. Should any erosion features develop, they should be stabilised as soon as possible. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	Medium to Low			
	Irreplaceability	Moderate			
Decommissioning Phase - Direct Impacts					
Disturbance and loss of aquatic habitat as a result of decommissioning activities in or adjacent to aquatic features for the substation, transmission line and service road construction	Status	Negative	Moderate to Low	<ul style="list-style-type: none"> ▪ During decommissioning, disturbance to the freshwater ecosystems should be limited as far as possible. Disturbed areas may need to be rehabilitated and revegetated. Mitigation and follow up monitoring of residual impacts (alien vegetation growth and erosion) may be required. ▪ Limit disturbance of watercourses through avoiding recommended buffers and utilising existing disturbed areas. ▪ A buffer of at least 32 m between the delineated aquatic ecosystems to the north of the substation footprint and the substation should be maintained. Runoff associated with the minor watercourses within the site will need to be diverted around the substation. ▪ Any indigenous vegetation clearing within or adjacent to the watercourses should be prevented as far as possible to minimise erosion within the watercourses. The cleared and disturbed areas surrounding the substation should be rehabilitated as far as possible with revegetation of cleared areas with local indigenous vegetation if necessary. An ECO or an appropriate specialist with knowledge and experience of the local flora be appointed during the decommissioning phase to be able to make clear recommendations with regards to the revegetation of disturbed areas. ▪ During the decommissioning phase, site management must be undertaken. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during the decommissioning activities such as hydrocarbon spills. Any stormwater that does arise within the site must be handled in a suitable 	Low to Very Low
	Extent	Local			
	Duration	Short Term			
	Consequence	Substantial to Moderate			
	Probability	Likely to Unlikely			
	Reversibility	Moderate			
	Irreplaceability	Moderate			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
				<p>manner to trap sediments and reduce flow velocities.</p> <ul style="list-style-type: none"> The existing road infrastructure should be utilised as far as possible to minimise the overall disturbance created by the proposed works. Where access routes need to be constructed through the watercourses, the disturbance of the channels should be limited. Wetland areas should be avoided and any road adjacent to a wetland feature should also remain outside of the 50m buffer zone. 	
Decommissioning Phase - Indirect Impacts					
Modification to flow and water quality due to the proposed activities in or adjacent to aquatic ecosystems.	Status	Negative	Moderate to Low	<ul style="list-style-type: none"> During decommissioning, disturbance to the freshwater ecosystems should be limited as far as possible. Disturbed areas may need to be rehabilitated and revegetated. Mitigation and follow up monitoring of residual impacts (alien vegetation growth and erosion) may be required. During the decommissioning phase, site management must be undertaken. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during the decommissioning activities such as hydrocarbon spills. Any stormwater that does arise within the decommissioning site must be handled in a suitable manner to trap sediments and reduce flow velocities. All crossings over watercourses should be such that the flow within the drainage channel is not impeded and should be constructed perpendicular to the river channel. Any disturbed areas should be rehabilitated and monitored to ensure that these areas do not become subject to erosion or invasive alien plant growth. 	Low to Very Low
	Extent	Local			
	Duration	Short Term			
	Consequence	Substantial to Moderate			
	Probability	Likely to Unlikely			
	Reversibility	High			
	Irreplaceability	Moderate			
Invasive alien plant growth and potential for erosion of watercourses due to the disturbance of aquatic vegetation	Status	Negative	Moderate to Low	<ul style="list-style-type: none"> Monitoring and clearing alien vegetation; mitigation of erosion on steeper slopes. During decommissioning, disturbance to the freshwater ecosystems should be limited as far as possible. Disturbed areas may need to be rehabilitated and revegetated. Mitigation and follow up monitoring of residual impacts (alien vegetation growth and erosion) may be required. Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested 	Low to Very Low
	Extent	Local			
	Duration	Medium Term			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Consequence	Substantial to Moderate		<ul style="list-style-type: none"> with invasive alien plants. Should any erosion features develop, they should be stabilised as soon as possible. 	
	Probability	Likely to Unlikely			
	Reversibility	Moderate to Low			
	Irreplaceability	Moderate			
Cumulative Impacts					
Cumulative impact of the proposed projects on freshwater ecosystems including disturbance activities within watercourses of the area; use of water and possible modification and contamination of runoff	Status	Negative	Low	<ul style="list-style-type: none"> Placement of the project elements to minimise disturbance of aquatic features within the site and allow for adequate buffers to ensure protection of the aquatic features. The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts. Good housekeeping measures as stipulated in the EMP for the project should be in place where construction activities take place to prevent contamination of any freshwater features. Where possible, the access roads should coincide with existing roads or areas of disturbance. Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation. Any new road crossings through the watercourses should preferably cross perpendicular to the channels and should not impede or concentrate flow in the channels. Undertake ongoing and long-term monitoring and management of aquatic features to prevent the impacts of erosion and invasive alien vegetation growth. 	Low
	Extent	Local			
	Duration	Short and Long Term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	Moderate			
	Irreplaceability	Moderate			

2.2.5. CONCLUDING IMPACT STATEMENT - AQUATIC ECOLOGY

The risk assessment for the project determined that the proposed power line and MTS poses a low risk of impacting aquatic habitat, water flow and water quality. With these findings of the risk assessment, the water use activities associated with the proposed project could potentially be authorised by means of the general authorisations for the Section 21(c) and (i) water uses.

Based on the findings, there is no reason from a freshwater perspective, why the proposed activity (with implementation of the recommended mitigation measures) should not be authorized (BlueScience (PTY) Ltd, 2019).

2.3. VISUAL IMPACT ASSESSMENT

A Visual Impact Assessment was conducted in 2017 by Henry Holland as part of the original BA Process in order to identify and assess potential impacts associated with the construction, operation and decommissioning phases of the proposed project on the surrounding sensitive viewers and receptors. The findings of the 2017 Visual Impact Assessment is still valid, and has been reviewed as part of this current BA Process. An addendum to the 2017 Visual Impact Assessment has been compiled by Scott Masson of SRK Consulting, which also includes an assessment of the new infrastructure that was not assessed during the previous assessment, specifically including the MTS and 400 kV power line. The Visual Impact Assessment Addendum is included in Appendix D.3 of this BA Report (SRK Consulting, 2019).

2.3.1. APPROACH AND METHODOLOGY

A brief description of the visual context of the area and a discussion on the potential visual impacts of the proposed project components that were not previously assessed was provided to understand the physical change the proposed project may have on the visual environment and sense of place. In addition, comment has been provided on the impact ratings provided by Holland (2017) for the previously assessed "Alternative Route 2" of the power line routing. The visual impacts of the proposed substation and 400 kV power line section (not previously assessed) were also assessed and additional mitigation measures to avoid or minimise visual impacts were provided.

2.3.2. PROJECT ASPECTS RELEVANT TO VISUAL IMPACTS

Elements of the construction and decommissioning phases of the proposed power line that will have a potential visual impact include clearing of vegetation for access roads, maintenance roads, power line servitudes, increased human activities in remote areas, which are likely to be noticed, exposure of large areas of soil, and increased alien invasive plant species which may contrast with the surrounding vegetation.

During the operational phase, the power lines and MTS can potentially intrude on scenic views and due to the linear nature of the proposed development the potential for scenic views can be affected for a large region.

2.3.3. POTENTIAL VISUAL IMPACTS

The following main impacts were identified in the 2017 Visual Impact Assessment (Holland, 2017):

Construction Phase:

- Potential visual intrusion of construction activities on existing views of sensitive visual receptors in the surrounding landscape.

Operational Phase:

- Potential landscape impact of the proposed electrical infrastructure on a rural agricultural landscape with a strong sense of remoteness and potential for scenic views; and
- Potential visual intrusion of the proposed electrical infrastructure on the views of sensitive visual receptors.

Decommissioning Phase:

- Potential visual intrusion of decommissioning activities on existing views of sensitive visual receptors.

Cumulative Impacts:

- Cumulative impact of renewable energy generation projects and electrical infrastructure on the existing rural-agricultural landscape; and
- Cumulative visual impact of renewable energy generation projects and electrical infrastructure on existing views of sensitive visual receptors in the surrounding landscape.

The following main impacts were identified in the 2019 Visual Impact Assessment Addendum:

Construction and Decommissioning Phases:

- Altered sense of place and visual intrusion during the proposed construction and decommissioning of the MTS as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust); and
- Altered sense of place and visual intrusion during the proposed construction and decommissioning of the 400 kV power line as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust).

Operational Phase:

- Altered sense of place and visual intrusion from the proposed MTS; and
- Altered sense of place and visual intrusion from the proposed 400 kV line.

The 2019 Visual Impact Assessment Addendum noted that the introduction of a new substation and a 4 km 400kV power line route is highly unlikely to further increase the cumulative impact of the proposed EGI on the visual character and sense of place of the study area.

2.3.4. IMPACT ASSESSMENT SUMMARY - VISUAL IMPACTS

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction and Decommissioning Phases					
Impacts identified in the 2019 Visual Impact Assessment Addendum					
Altered sense of place and visual intrusion during the proposed construction and decommissioning of the MTS as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust)	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Limit and phase vegetation clearance and the footprint of construction and decommissioning activities to what is absolutely essential. ▪ Utilise existing access roads as far as possible. ▪ Consolidate the footprint of the construction camp to a functional minimum. Screen the yard with materials that blend into the surrounding area. ▪ Avoid excavation, handling and transport of materials which may generate dust under high wind conditions. ▪ Keep construction and decommissioning sites tidy and all activities, material and machinery contained within an area that is as small as possible. ▪ Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction and Decommissioning Phases. 	Very Low
	Extent	Local			
	Duration	Short-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Altered sense of place and visual intrusion during the proposed construction and decommissioning of the 400 kV power line as a result of earthworks, resultant scarring and construction activities (including clearing of vegetation and dust)	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Limit and phase vegetation clearance and the footprint of construction and decommissioning activities to what is absolutely essential. ▪ Utilise existing access roads as far as possible. If new roads are required, then avoid clearing natural vegetation to facilitate access to the final pylon positions. If access across natural vegetation is required, then prune/remove large shrubs rather than clearing vegetation completely. ▪ Avoid excavation, handling and transport of materials which may generate dust under high wind conditions. ▪ Keep construction and decommissioning sites tidy and all activities, material and machinery contained within an area that is as small as possible. ▪ Rehabilitate disturbed areas incrementally and as soon as possible, not necessarily waiting until completion of the Construction and Decommissioning Phases. 	Very Low
	Extent	Local			
	Duration	Short-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	Moderate			
	Irreplaceability	Low			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Impacts identified in the 2017 Visual Impact Assessment (Holland, 2017)					
<p>Potential visual intrusion of activities associated with the construction of electrical infrastructure along Alternative 2* on existing views of sensitive visual receptors in the surrounding landscape.</p> <p><u>Note from the CSIR: As discussed in the Project Description section of this BA Report, the previously assessed Alternative 2 power line routing serves as the current 132 kV power line routing from the proposed Sutherland on-site substation to the MTS.</u></p>	Status	Negative		<ul style="list-style-type: none"> ▪ Implement mitigation measures associated with construction activities to ensure that they are managed and performed in such a way as to minimise its impact on the receiving environment, as well as minimising visual impact during the construction phase. These best practice guidelines for construction can include: <ul style="list-style-type: none"> ○ The contractor is required to maintain good housekeeping on site to avoid litter and minimise waste; ○ The Project Developer is required to demarcate construction boundaries and minimise areas of surface disturbance; ○ Vegetation and ground disturbance should be minimised, and existing clearings should be taken advantage of where possible; ○ Construction of new access roads should be minimised and existing roads should be used where possible; ○ Topsoil from the site should be stripped, stockpiled, and stabilised before excavating earth for the construction of the proposed distribution line; ○ Vegetation material from vegetation removal will be mulched and spread over fresh soil disturbances to aid in the rehabilitation process; ○ Plans should be in place to control and minimise erosion risks; ○ Plans should be in place to minimise fire hazards and dust generation; and ○ Plans should be in place to rehabilitate cleared areas as soon as possible. ▪ Where possible construction camps and laydown areas should be located (where sensitive visual receptors are least likely to be affected): <ul style="list-style-type: none"> ○ In low visibility areas (e.g. avoid ridgelines and open plains); ○ Previously disturbed areas (e.g. clearings created by farmers for other purposes which are no longer being used); and/or ○ Areas near derelict farmsteads (taking into consideration the findings of the Heritage Impact Assessment as well as other assessments that may be relevant), particularly where existing trees can be used to screen these areas from views. ▪ Particular care should be taken to avoid erosion scarring and damage 	
	Extent	Local			
	Duration	Short-term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	High			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Irreplaceability	Low		<ul style="list-style-type: none"> along the ridge down the escarpment; Night time construction should be avoided where possible (however some construction work on electrical components may need to occur after dark). Night lighting of the construction sites should be minimised within requirements of safety and efficiency. 	
Operational Phase					
Impacts identified in the 2019 Visual Impact Assessment Addendum					
Altered sense of place and visual intrusion from the proposed MTS.	Status	Negative	Low	<ul style="list-style-type: none"> Be sensitive towards the use of glass or material with a high reflectivity which may cause glare and increase visual impacts. Use low-impact fencing of appropriate colour, such as diamond wire-mesh fencing which is less visually intrusive when viewed from a distance. Palisade fencing and other solid fence structures should be avoided. Design buildings to be similar to the vernacular of the surrounding farmstead buildings. Consider using excess excavated material to construct a low (< 1 m) vegetated berm around the substation site to screen the bulk of the substation. 	Very Low
	Extent	Local			
	Duration	Long-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Altered sense of place and visual intrusion from the proposed 400 kV line	Status	Negative	Low	<ul style="list-style-type: none"> Locate pylons away from farmstead buildings and beyond the direct line of sight from these buildings as far as possible. Locate pylons the maximum distance from watercourses as possible. Install lattice structures (as the preferred pylon structure) as far as possible. Do not illuminate pylons. Rehabilitate areas affected by scarring and put measures in place to prevent erosion. (In discussion with the avifauna specialist) reduce the number of bird flappers / balls along the power line route. 	Low
	Extent	Local			
	Duration	Long-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Impacts identified in the 2017 Visual Impact Assessment (Holland, 2017)					
Potential landscape impact of the proposed electrical infrastructure along Alternative 2 on a rural agricultural landscape with a	Status	Negative	Low	<ul style="list-style-type: none"> None recommended 	Low
	Extent	Local			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
<p>strong sense of remoteness and potential for scenic views.</p> <p><i>Note from the CSIR: As discussed in the Project Description section of this BA Report, the previously assessed Alternative 2 power line routing serves as the current 132 kV power line routing from the proposed Sutherland on-site substation to the MTS.</i></p>	Duration	Long-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Low			
<p>Potential visual intrusion of the proposed electrical infrastructure along Alternative 2 on the views of sensitive visual receptors.</p> <p><i>Note from the CSIR: As discussed in the Project Description section of this BA Report, the previously assessed Alternative 2 power line routing serves as the current 132 kV power line routing from the proposed Sutherland on-site substation to the MTS.</i></p>	Status	Negative	Low	<ul style="list-style-type: none"> Lattice type towers should be used as they will be better camouflaged against the mottled vegetation and rock background than monopole towers. Although monopole structures can be seen as aesthetically more pleasing than lattice type structures, either is likely to cause negative visual impacts on views. The mitigation measure proposed here is therefore intended to reduce the visibility of the structures rather than to improve its aesthetics. This is not an essential mitigation measure and it is unlikely to lower the significance of the impact for Alternative 2 but will reduce the visibility of the development. 	Low
	Extent	Local			
	Duration	Long-term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	High			
Irreplaceability	Low				
Decommissioning Phase					
Impacts identified in the 2017 Visual Impact Assessment (Holland, 2017)					
Potential visual intrusion of decommissioning activities associated with electrical	Status	Negative		<ul style="list-style-type: none"> Where possible decommissioning camps and laydown areas should be located (where sensitive visual receptors are least likely to be affected): <ul style="list-style-type: none"> In low visibility areas (e.g. avoid ridgelines and open plains); 	

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
infrastructure along Alternative 2 on views of sensitive visual receptors. <i>Note from the CSIR: As discussed in the Project Description section of this BA Report, the previously assessed Alternative 2 power line routing serves as the current 132 kV power line routing from the proposed Sutherland on-site substation to the MTS.</i>	Extent	Local		<ul style="list-style-type: none"> ○ Previously disturbed areas (e.g. clearings created by farmers for other purposes which are no longer being used); and/or ○ Areas near derelict farmsteads (taking into consideration the findings of the Heritage Impact Assessment as well as other assessments that may be relevant), particularly where existing trees can be used to screen these areas from views. ▪ Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes. ▪ Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of indigenous species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape. ▪ Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape. ▪ Working at night should be avoided, where possible. ▪ Night lighting of reclamation sites should be minimised within requirements of safety and efficiency. 	
	Duration	Short-term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Low			
Cumulative Impacts					
Impacts identified in the 2017 Visual Impact Assessment (Holland, 2017)					
Cumulative impact of renewable energy generation projects and large scale electrical infrastructure on the existing rural-agricultural landscape.	Status	Negative	Very Low	<ul style="list-style-type: none"> ▪ None recommended 	Very Low
	Extent	Regional			
	Duration	Long-term			
	Consequence	Slight			
	Probability	Unlikely			
	Reversibility	High			
	Irreplaceability	Low			
Cumulative visual impact of renewable energy generation projects and large scale electrical infrastructure on existing views of sensitive visual receptors in the surrounding landscape.	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Lattice type towers should be used as they will be better camouflaged against the mottled vegetation and rock background than monopole towers. Although monopole structures can be seen as aesthetically more pleasing than lattice type structures, either is likely to cause negative visual impacts on views. The mitigation measure proposed here is therefore intended to reduce the visibility of the structures rather than to improve its aesthetics. This is not an essential mitigation measure but its 	Very Low
	Extent	Regional			
	Duration	Long-term			
	Consequence	Slight to Moderate			
	Probability	Likely			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Reversibility	High		implementation will potentially lower the significance of the impact to very low.	
	Irreplaceability	Low			

2.3.5. CONCLUDING IMPACT STATEMENT - VISUAL IMPACTS

The 2017 Visual Impact Assessment (Holland, 2017) identified Alternative Route 1 as the preferred alternative as the 132 kV power line is shorter and will affect fewer sensitive visual receptors. Although Alternative Route 2 (i.e. the subject of this BA) would have a higher overall visual impact than Alternative Route 1, no fatal (visual) flaws have been identified and the overall visual impacts of Alternative Route 2 are acceptable if the recommended mitigation measures are implemented. The proposed MTS will change the land use of an (16 ha) area from unbuilt to built but the substation will be visible to very few sensitive receptors. The impact of the proposed MTS substation during operations is assessed to be of low significance, and with the implementation of mitigation, is reduced to very low. Although the proposed 400 kV power line may be visible from a large area on the plains, the power line may not be noticeable to receptors located in the background, although is likely to alter the sense of place of receptors located in the foreground. However, there are very few sensitive receptors located in the foreground. In conclusion, SRK Consulting is of the opinion that on purely 'visual' grounds (i.e. the project's potential visual impacts); the proposed project as currently articulated should be approved, provided the essential mitigation measures are implemented (SRK Consulting, 2019).

2.4. HERITAGE IMPACT ASSESSMENT

The Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape) was undertaken by Dr. Jayson Orton of ASHA Consulting, with inputs from Dr. John Almond of Natura Viva cc on Palaeontology. This report is included in Appendix D.4 of this BA Report (ASHA Consulting (PTY) Ltd, 2019).

The purpose of the Heritage Impact Assessment is to identify any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa.

The Heritage Impact Assessment Report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the DEFF. The Heritage Impact Assessment Report outlines management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

2.4.1. APPROACH AND METHODOLOGY

A survey of available literature was carried out to assess the general heritage context into which the proposed development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:250 000 map sourced from the Chief Directorate: National Geo-Spatial Information was also used. Data were also collected via field surveys. In this regard, during the 2017 assessment five days were spent covering various parts of the proposed alignment (i.e. 15, 17 and 18 November 2016 and 2 and 3 February 2017). Two further days were spent on site on 10 and 11 May 2019. A description of the affected environment is included in Section B of this BA Report.

2.4.2. PROJECT ASPECTS RELEVANT TO HERITAGE IMPACTS

All aspects of the proposed development are relevant, since excavations for foundations may impact on archaeological and/or palaeontological remains, while the above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

2.4.3. POTENTIAL HERITAGE IMPACTS

The following potential impacts associated with the proposed electricity grid infrastructure development have been identified:

- Construction Phase:
 - Direct Impacts:
 - Damage or destruction of archaeological resources as a result of the construction of the proposed infrastructure.
 - Damage or destruction of palaeontological resources as a result of the construction of the proposed infrastructure.
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.
- Construction Phase:
 - Indirect Impacts:
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.
- Operational Phase:
 - Direct Impacts:
 - Damage or destruction of archaeological resources as a result of the operation of the proposed infrastructure.
 - Damage or destruction of palaeontological resources as a result of the operation of the proposed infrastructure.
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the operation of the proposed infrastructure.
- Operational Phase:
 - Indirect Impacts:
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the operation of the proposed infrastructure.
- Decommissioning Phase:
 - Direct Impacts:
 - Damage or destruction of archaeological resources as a result of the decommissioning of the proposed infrastructure.
 - Damage or destruction of palaeontological resources as a result of the decommissioning of the proposed infrastructure.
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the decommissioning of the proposed infrastructure.
- Decommissioning Phase:
 - Indirect Impacts:
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the decommissioning of the proposed infrastructure.

The following cumulative impacts were also identified:

- Construction Phase:
 - Direct Impacts:
 - Damage or destruction of archaeological resources as a result of the construction of the proposed infrastructure.
 - Damage or destruction of palaeontological resources as a result of the construction of the proposed infrastructure.

- Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.
- Construction Phase:
 - Indirect Impacts:
 - Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.

2.4.4. IMPACT ASSESSMENT SUMMARY - HERITAGE IMPACTS

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase - Direct Impacts					
Damage or destruction of archaeological resources as a result of the construction of the proposed infrastructure.	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Avoid and protect all nearby sites if possible. ▪ No widening of road at waypoint 546. ▪ No pylon placement within 30 m of waypoint 1785. ▪ Pre-construction survey of any as yet unsurveyed sections to identify no-go areas or further mitigation requirements. ▪ Record/sample any sites to be impacted. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Substantial			
	Probability	Very likely			
	Reversibility	Non-Reversible			
	Irreplaceability	High			
Damage or destruction of palaeontological resources as a result of the construction of the proposed infrastructure.	Status	Negative	Very Low	<ul style="list-style-type: none"> ▪ Avoid and protect fossils if possible. ▪ Monitoring by the ECO and rescue of isolated finds. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Slight			
	Probability	Unlikely			
	Reversibility	Non-Reversible			
	Irreplaceability	Moderate			
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Avoid steep slopes and cut-and-fill activities. ▪ Rehabilitate any areas not required during operation. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase - Indirect Impacts					
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of the proposed infrastructure.	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Avoid steep slopes and cut-and-fill activities. ▪ Rehabilitate any areas not required during operation. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			
Operational Phase - Direct Impacts					
Damage or destruction of archaeological resources as a result of the operation of the proposed infrastructure.	Status	Negative	Very Low	<ul style="list-style-type: none"> ▪ No driving off the established service tracks. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Slight			
	Probability	Extremely Unlikely			
	Reversibility	Non-Reversible			
	Irreplaceability	High			
Damage or destruction of palaeontological resources as a result of the operation of the proposed infrastructure.	Status	Negative	Very Low	<ul style="list-style-type: none"> ▪ No driving off the established service tracks. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Slight			
	Probability	Extremely Unlikely			
	Reversibility	Non-Reversible			
	Irreplaceability	Moderate			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the operation of the proposed infrastructure.	Status	Negative	Low	<ul style="list-style-type: none"> No driving off the established service tracks. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			
Operational Phase - Indirect Impacts					
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the operation of the proposed infrastructure.	Status	Negative	Low	<ul style="list-style-type: none"> No driving off the established service tracks. 	Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			
Decommissioning Phase - Direct Impacts					
Damage or destruction of archaeological resources as a result of the decommissioning of the proposed infrastructure.	Status	Negative	Very Low	<ul style="list-style-type: none"> Stay on service road at all times. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Slight			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
	Probability	Extremely unlikely			
	Reversibility	Non-reversible			
	Irreplaceability	High			
Damage or destruction of palaeontological resources as a result of the decommissioning of the proposed infrastructure.	Status	Negative	Very Low	<ul style="list-style-type: none"> Stay on service road at all times. 	Very Low
	Extent	Site Specific			
	Duration	Permanent			
	Consequence	Slight			
	Probability	Extremely unlikely			
	Reversibility	Non-reversible			
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the decommissioning of the proposed infrastructure.	Irreplaceability	Moderate	Very Low	<ul style="list-style-type: none"> Stay on service road at all times. Ensure rehabilitation is effective and that no landscape scarring remains visible from long distances. 	Very Low
	Status	Negative			
	Extent	Local			
	Duration	Short Term			
	Consequence	Slight			
	Probability	Very likely			
Reversibility	High				
Decommissioning Phase - Indirect Impacts					
Alteration of the cultural landscape (i.e. scarring of the landscape and	Status	Negative	Very Low	<ul style="list-style-type: none"> Stay on service road at all times. Ensure rehabilitation is effective and that no landscape scarring remains visible from long distances. 	Very Low
	Extent	Local			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
visual/contextual impacts to the rural/natural landscape) as a result of the decommissioning of the proposed infrastructure.	Duration	Short Term			
	Consequence	Slight			
	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			
Cumulative Impacts (Construction Phase)					
Damage or destruction of archaeological resources as a result of the construction of the proposed infrastructure.	Status	Negative	Low	<ul style="list-style-type: none"> ▪ Avoid and protect sites if possible. ▪ No widening of road at waypoint 546. ▪ Pre-construction survey of any as yet unsurveyed sections to identify no-go areas or further mitigation requirements. ▪ Record significant sites in footprint to be impacted. 	Very Low
	Extent	Local			
	Duration	Permanent			
	Consequence	Moderate			
	Probability	Very likely			
	Reversibility	Non-Reversible			
	Irreplaceability	High			
Damage or destruction of palaeontological resources as a result of the construction of the proposed infrastructure.	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Avoid and protect fossils if possible. ▪ Monitoring by ECO and rescue of isolated finds. 	Very Low
	Extent	Local			
	Duration	Permanent			
	Consequence	Substantial			
	Probability	Unlikely			
	Reversibility	Non-Reversible			
	Irreplaceability	Moderate			
Alteration of the cultural landscape (i.e. scarring of the landscape and visual/contextual impacts to the rural/natural landscape) as a result of the construction of	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ Avoid creating roads up steep slopes. ▪ Follow suggested service road detour. ▪ Rehabilitate any areas not required during operation. 	Moderate
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
the proposed infrastructure. This includes both direct and indirect impacts.	Probability	Very likely			
	Reversibility	High			
	Irreplaceability	Moderate			

2.4.5. CONCLUDING IMPACT STATEMENT - HERITAGE IMPACTS

There are no fatal flaws identified in the Heritage Impact Assessment and because there are few heritage sites located within close proximity of the alignments, the potential impacts to all types of heritage resources are of generally moderate-low significance before mitigation and very low significance after mitigation.

Since there are unlikely to be significant impacts to heritage resources that cannot be managed or mitigated, it is recommended that the proposed development be authorised. However, the relevant conditions should be incorporated into the EA, as specified in Section E of this BA Report (ASHA Consulting (PTY) Ltd).

2.5. AVIFAUNA IMPACT ASSESSMENT

The Avifauna Impact Assessment was undertaken by Chris van Rooyen and Albert Froneman of Chris van Rooyen Consulting and is included in Appendix D.5 of this BA Report (Chris van Rooyen Consulting, 2019).

The objectives of the Avifauna Impact Assessment are to investigate the potential impacts of the proposed infrastructure on avifauna in order to assess whether the project is fatally flawed from an avifaunal impact perspective and, if not, what mitigation measures should be implemented to reduce the potential impacts.

2.5.1. APPROACH AND METHODOLOGY

A detailed site visit as well as a desktop review of the available information was conducted in order to identify and characterise the avifaunal features of the site. The study was also informed by a 12-month pre-construction bird monitoring survey associated with the proposed WEFs, as well as a site visit in April 2019. A description of the affected environment is included in Section B of this BA Report.

2.5.2. PROJECT ASPECTS RELEVANT TO AVIFAUNA IMPACTS

The following project aspects are relevant from a bird impact assessment perspective:

- Major Transmission Substation (400 m x 400 m);
- Overhead 132 kV line of approximately 41 km; and
- 400 kV ~ 4 km overhead transmission line connecting to an existing Eskom power line.

2.5.3. POTENTIAL AVIFAUNAL IMPACTS

The following potential impacts associated with the proposed electricity grid infrastructure development have been identified:

- Construction Phase:
 - Displacement of priority avifauna due to disturbance associated with the construction of the proposed power lines, service road and transmission substation.
 - Displacement of priority avifauna due to habitat transformation associated with the construction of the transmission substation.
- Operational Phase:
 - Mortality of priority avifauna due to collisions with the earth wire of the proposed 132 kV and 400 kV power lines.
 - Electrocution of priority avifauna in the transmission substation yard.
- Decommissioning Phase:
 - Displacement of priority avifauna due to disturbance associated with the decommissioning of the proposed power line, service road and transmission substation.

The following cumulative impacts were also identified:

- Displacement of priority avifauna due to disturbance associated with the construction of the proposed power lines, service road and transmission substation in conjunction with existing and future similar projects.
- Displacement of priority avifauna due to habitat transformation associated with the construction of the transmission substation in conjunction with existing and future similar projects.
- Mortality of priority avifauna due to collisions with the earth wire of the proposed 132 kV and 400 kV lines
- Electrocutions in the transmission substation yard in conjunction with existing and future similar projects.

2.5.4. IMPACT ASSESSMENT SUMMARY - AVIFAUNA

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase					
Displacement of priority avifauna due to disturbance associated with the construction of the proposed power lines, service road and transmission substation.	Status	Negative	Moderate	<ul style="list-style-type: none"> ▪ A site-specific Construction Environmental Management Programme (CEMPr) CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following: <ul style="list-style-type: none"> ○ No off-road driving; ○ Maximum use of existing roads; ○ Measures to control noise; ○ Restricted access to the rest of the property; ○ The appointed ECO must be trained by an avifaunal specialist to identify the potential priority species as well as the signs that indicate possible breeding by these species. The ECO must then, during audits/site visits, make a concerted effort to look out for such breeding activities of especially Red Data species, and such efforts may include the training of construction staff to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species. If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed; and ○ Prior to construction, an avifaunal specialist should conduct a site walk through, covering the final service road and power line routes, to identify any nests/breeding/roosting activity of priority species, as well as any additional sensitive habitats. The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around avian breeding and/or movement schedules, and lowering levels of associated noise. 	Low
	Extent	Site Specific			
	Duration	Short Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	Highly Reversible			
	Irreplaceability	Replaceable			
Displacement of priority avifauna due to habitat	Status	Negative	Low	<ul style="list-style-type: none"> ▪ A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted to 	Low

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
transformation associated with the construction of the transmission substation.	Extent	Site Specific		reduce unnecessary destruction and degradation of habitat. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr should specifically include the following: <ul style="list-style-type: none"> ○ The minimum footprint areas for infrastructure should be used wherever possible, including road widths and lengths; ○ No off-road driving; ○ Maximum use of existing roads; ○ Measures to control dust; ○ Restricted access to the rest of the property; and ○ Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks) must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly. 	
	Duration	Long Term			
	Consequence	Extreme			
	Probability	Very unlikely			
	Reversibility	High			
	Irreplaceability	Replaceable			
Operational Phase					
Mortality of priority avifauna due to collisions with the earth wire of the proposed 132kV and 400kV power lines.	Status	Negative	High	<ul style="list-style-type: none"> ▪ An avifaunal specialist must conduct a site walk through of final pylon positions prior to construction to determine if, and where, BFDs are required. ▪ Install BFDs as per the instructions of the specialist following the site walk through, which may include the need for modified BFDs fitted with solar powered LED lights on certain spans. ▪ The operational monitoring programme must include regular (quarterly) monitoring of the grid connection power line for collision mortalities. 	Moderate
	Extent	Local			
	Duration	Long Term			
	Consequence	Severe			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Replaceable			
Electrocution of priority avifauna in the transmission substation yard.	Status	Negative	Very Low	<ul style="list-style-type: none"> ▪ The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied reactively. This is an acceptable approach because Red Data avifauna is unlikely to frequent the substation and be electrocuted. 	Very Low
	Extent	Local			
	Duration	Long Term			
	Consequence	Severe			
	Probability	Extremely Unlikely			
	Reversibility	High			
	Irreplaceability	Replaceable			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Decommissioning Phase					
Displacement of priority avifauna due to disturbance associated with the decommissioning of the proposed power line, service road and transmission substation	Status	Negative	Moderate	<ul style="list-style-type: none"> A site-specific Decommissioning EMPr (DEMPr) must be implemented, which gives appropriate and detailed description of how decommissioning activities must be conducted to reduce unnecessary destruction of habitat. All contractors are to adhere to the DEMPr and should apply good environmental practice during decommissioning. Following decommissioning, rehabilitation of all areas disturbed must be undertaken and to this end a habitat restoration plan is to be developed by a rehabilitation specialist and implemented accordingly. 	Low
	Extent	Site Specific			
	Duration	Short Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Replaceable			
Cumulative Impacts					
<ul style="list-style-type: none"> Displacement of priority avifauna due to disturbance associated with the construction of the proposed power lines, service road and transmission substation in conjunction with existing and future similar projects. Displacement of priority avifauna due to habitat transformation associated with the construction of the transmission substation in conjunction with existing and future similar projects. Mortality of priority avifauna due to collisions with the earth wire of the proposed 132kV and 400kV lines. 	Status	Negative	Moderate	<ul style="list-style-type: none"> Refer to the mitigation measures provided above for the construction, operational and decommissioning phases. 	Moderate
	Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Very Likely			
	Reversibility	High			

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
<ul style="list-style-type: none"> ▪ Electrocutions in the transmission substation yard in conjunction with existing and future similar projects. 	Irreplaceability	Replaceable			

2.5.5. CONCLUDING IMPACT STATEMENT - AVIFAUNA

The overall potential impact on priority avifauna for the construction phase is assessed to be of **Moderate to Low** significance before mitigation measures, and **Low** after the implementation of mitigation measures.

For the decommissioning phase, the overall potential impact on priority avifauna is assessed with a **Moderate** significance before the implementation of mitigation and a **Low** significance after the implementation of mitigation measures.

For the operational phase, the overall potential impact on priority avifauna is assessed with a **Very Low to High** significance without the implementation of mitigation measures; and **Very Low to Moderate** significance with the implementation of mitigation measures.

Cumulative impacts are assessed with a **Moderate** significance both with and without mitigation measures.

In terms of an average, the pre-mitigation significance of all potential impacts identified in this specialist study is assessed as **Moderate to Low**, leaning more towards Moderate (i.e. average of 3.4) and the post-mitigation significance is assessed as **Low to Moderate**, leaning more towards Low (i.e. average of 3.8). It is therefore recommended that the activity is authorised, on condition that the proposed mitigation measures as detailed in the EMPr are strictly implemented (Chris van Rooyen Consulting, 2019).

2.6. AGRICULTURAL IMPACT ASSESSMENT

The Agricultural Impact Assessment was undertaken by Johann Lanz (Independent Consultant) and is included in Appendix D.6 of this BA Report (Lanz, 2019).

The objectives of the Agricultural Impact Assessment were to identify and assess all potential impacts of the proposed development on agricultural resources including soils and agricultural production potential, and to provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines for all identified potential impacts.

2.6.1. APPROACH AND METHODOLOGY

The soil investigation applied an appropriate level of detail for the agricultural suitability on site and for the level of impact of the proposed development on agricultural land. A detailed soil survey, as per the requirements of the Department of Agriculture, Forestry and Fisheries (DAFF) (now operating as the Department of Agriculture, Land Reform and Rural Development), is only appropriate for a significant footprint of impact on arable land. It has little relevance to an assessment of agricultural potential in this environment, where the agricultural limitations are overwhelmingly climatic, terrain is rugged, soil conditions are generally poor, and cultivation potential is non-existent. In such an environment, even where soils suitable for cultivation may occur, they cannot be cultivated because of the aridity and terrain constraints. A field investigation was therefore not considered necessary.

The assessment was based on a desktop analysis of existing soil and agricultural potential data and other data for the site, which is considered entirely adequate for a thorough assessment of all the agricultural impacts of the proposed development. A description of the affected environment is included in Section B of this BA Report.

2.6.2. PROJECT ASPECTS RELEVANT TO AGRICULTURAL IMPACTS

All the project components are relevant from an agricultural and soils perspective.

2.6.3. AGRICULTURAL SENSITIVITY

In terms of the sensitivity categories used in the REDZ sensitivity analysis, this site was assessed as low sensitivity (DEA, 2015).

The entire study area has extremely low agricultural potential and therefore very low agricultural sensitivity to development and consequent loss of agricultural land use. Agricultural potential and conditions are also very uniform across the site, and the choice of placement of facility infrastructure therefore has negligible influence on the significance of agricultural impacts. From an agricultural point of view, no parts of the site need to be avoided by the proposed development and no buffers are required.

2.6.4. POTENTIAL SOILS AND AGRICULTURAL IMPACTS

The following potential impacts associated with the proposed Electrical Grid Infrastructure development have been identified in relation to soils and agriculture:

- Construction Phase:
 - Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during construction activities.
- Decommissioning Phase:
 - Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during decommissioning activities.

The following cumulative impact was also identified:

- Loss of agricultural land as a result of occupation of and disturbance to agricultural land as a result of multiple projects.

2.6.5. IMPACT ASSESSMENT SUMMARY - AGRICULTURAL IMPACTS

Impact	Impact Criteria		Significance (Pre-Mitigation)	Potential mitigation measures	Significance (Post-Mitigation)
Construction Phase					
Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during construction activities.	Status	Negative	Low	<ul style="list-style-type: none"> Implement an effective system of storm water run-off control, where it is required. It would only be required where land disturbance could potentially lead to run-off accumulation that might then lead to down slope erosion. The system should control water movement by means of bunds and ditches, so that it safely disperses and disseminates any run-off accumulation into the veld. 	Very Low
	Extent	Site Specific			
	Duration	Medium Term			
	Consequence	Moderate			
	Probability	Very Unlikely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Decommissioning Phase					
Soil erosion and degradation as a result of land surface disturbance including vegetation removal, vehicle passage and excavation during decommissioning activities.	Status	Negative	Low	<ul style="list-style-type: none"> Implement an effective system of storm water run-off control, where it is required. It would only be required where land disturbance could potentially lead to run-off accumulation that might then lead to down slope erosion. The system should control water movement by means of bunds and ditches, so that it safely disperses and disseminates any run-off accumulation into the veld. 	Very Low
	Extent	Site Specific			
	Duration	Medium Term			
	Consequence	Moderate			
	Probability	Very Unlikely			
	Reversibility	Moderate			
	Irreplaceability	Low			
Cumulative Impacts					
Loss of agricultural land as a result of occupation of and disturbance to agricultural land as a result of multiple projects.	Status	Negative	Very Low	<ul style="list-style-type: none"> No additional mitigation measures other than those identified above. 	Very Low
	Extent	Regional			
	Duration	Long Term			
	Consequence	Slight			
	Probability	Very Unlikely			
	Reversibility	Moderate			
	Irreplaceability	Low			

2.6.6. CONCLUDING IMPACT STATEMENT - AGRICULTURE

There are no agriculturally sensitive areas that need to be avoided by the proposed development.

Due to the low agricultural potential of the site, and the important fact that transmission lines have such little impact on agriculture, as well as the minimal impact of the substation in this agricultural environment, the impact of the development is assessed as very low. There are therefore no restrictions relating to agriculture which preclude authorisation of the proposed development and therefore, from an agricultural impact point of view, the development should be authorised.

There are no conditions resulting from this Agricultural Assessment that need to be included in the EA (Lanz, 2019).

2.7. NO-GO OPTION

As noted in Section A of this BA Report, the no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed supporting Electrical Grid Infrastructure. This alternative would result in no environmental impacts (as identified in Section D of this BA Report) on the site or surrounding local area. The following implications will occur if the “no-go” alternative is implemented (i.e. if the proposed project is not constructed):

- There will be negative implications for the proposed Sutherland, Sutherland 2 and Rietrug WEFs, which have already been authorised as part of a separate EIA Process, as there will be no dedicated, fundamental electrical infrastructure to allow the proposed WEF to connect to the national grid via the proposed MTS. This could possibly result in non-realisation of the benefits, such as economic spin offs and electricity generation, associated with the proposed WEFs.
- The landowners of the affected farm portions will not be able to derive benefits from the implementation of an additional land-use;
- No additional power will be generated or supplied through means of renewable energy resources by this project at this location;
- There will be no contributions and assistance to the government in achieving its proposed renewable energy target of 17 800 MW by 2030;
- No additional power to the local grid will be provided via the Eskom grid, with approximately 90% coal-based power generation with associated high levels of CO₂ emissions and water consumption;
- Electricity generation will remain constant (i.e. no additional renewable energy generation will occur on the proposed site) and the local economy will not be diversified;
- Local communities will continue their dependence on agriculture production and government subsidies;
- There will be no opportunity for additional employment in an area where job creation is identified as a key priority;
- There will be lost opportunity for skills transfer and education/training of local communities;
- The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realised.

Converse to the above, the following benefits could occur if the “no-go” alternative is implemented:

- No threatened vegetation will be removed or disturbed during the development of the proposed electrical infrastructure;
- No potential impact to avifauna present in the area;
- No change to the current landscape will occur; and
- No additional water use and waste generation will occur as a result of the construction phase.

It is important to take into account that the country is facing serious power and water shortages due to its heavy dependency on fossil fuels such as coal. There is therefore a need for additional

electricity generation options to be developed throughout the country. The purpose of the proposed project is to transmit electricity generated by a renewable energy resource into the national electricity grid. Many other socio-economic and environmental benefits will result from the development of this project such as development of renewable energy resources in the country and contribution to the increase of energy security, employment creation and local economic development (as noted above). The impact assessment undertaken and discussed within Section D of this BA Report shows that no significant residual impacts or risks (high significant impacts) would occur, following the implementation of the required mitigation measures.

Hence, the “no-go” alternative will result in both positive and negative implications, by not going ahead with the project. In addition, by not constructing the proposed Electrical Grid Infrastructure, any positive community development or socio-economic benefits associated with the WEF would not be realised. Since the WEF has already received EA (dated 10 November 2016, which is currently being amended), it is deemed that the impacts associated with the WEF are acceptable in terms of still ensuring environmental sustainability and ecological functioning.

Listed below is a summary of the findings of the no-go option, as discussed in the specialist studies:

- Terrestrial Ecology Impact Assessment: It is evident that should the establishment of the proposed infrastructure not arise, that no ecological change will ensue. However, it is clear that with the implementation of avoidance and mitigation measures as described in this specialist study and BA Report, that the “no-go” alternative is undesirable as it fails to achieve the economic and socio-economic benefits that are associated with the broader proposal. As such, it can be forecast that the “no go” alternative will see the maintenance of the prevailing habitat, with no change to the broader eco-morphology of the study area; and habitat and faunal behaviour will continue to be determined by meteorological and the continued prevailing land use, only.
- Aquatic Ecology (Freshwater) Impact Assessment: The No-go Alternative implies that the transmission line and substation would not be established within the area and that low-level agricultural practices would continue. The existing agricultural practices within the study area have had a very low impact on the freshwater features in the area. Should the transmission line and substation not be developed, it is likely that the aquatic features would remain in a natural to largely natural ecological condition. Water is however a limiting factor on the future development of the area. Invasive alien plant growth within the riparian areas of the rivers, as well as erosion of the watercourses within the area should be continually managed to reduce any impacts on the freshwater features.
- Visual Impact Assessment: It is important to re-iterate that the proposed electrical infrastructure is required in order to support the proposed Sutherland, Sutherland 2 and Rietrug WEFs, and to enable the electricity that is generated by the WEFs to the national grid. If authorised and built the Sutherland, Sutherland 2 and Rietrug WEFs will dominate the landscape in the vicinity of the proposed electrical infrastructure. Wind turbines will be prominent elements in most views in the surrounding region. The proposed electrical infrastructure is a very minor visual aspect of a WEF landscape. As such the no-go alternative will not make much of a difference to the landscape or views, particularly if wind turbines are seen as a negative impact by visual receptors. In addition, the Western Cape Provincial SDF indicates that there are two shale gas exploration permits issued for the area proposed for this project, while the Hoogland Karoo SDF refers to the possibility of Uranium mining in the Salpeterkop region along the banks of the Rietrivier. Therefore, the no-go Alternative does not guarantee that there will not be pressure to develop the region in the future (Holland, 2017).
- Heritage Impact Assessment (Archaeology and Cultural Landscape): The no-go alternative has not been specifically assessed because no new impacts would occur through continued use of the landscape according to the status quo (i.e. small stock farming). Impacts would thus be seen as of very low significance.
- Heritage Impact Assessment (Palaeontology): The impact assessment for the no-go option considers future impacts on local fossil heritage that are likely to occur in the absence of the proposed power line and substation development, using the present status of fossil heritage in the area as a baseline. Destruction of near-surface or surface fossil material by natural bedrock

weathering and erosion will be partially counterbalanced by on-going exposure of fresh fossil material by erosion. Improvements in the understanding of palaeontology of the area (a possible positive impact) will depend on whether or not field-based academic or impact studies are carried out, which is inherently unpredictable (There is an on-going research project on the palaeontology of the south-west Karoo by Wits University). The no-go alternative (i.e. no development) will probably have a low (neutral) impact on palaeontological heritage.

- Avifauna Impact Assessment: The no-go option will result in no additional impacts on avifauna and will result in the ecological status quo being maintained (as described in Section 4 of the Avifauna Impact Assessment in Appendix D.5 of this BA Report).
- Agricultural Impact Assessment: The no-go option will result in no additional impacts on agriculture and will result in the status quo being maintained. However, the proposed project has negligible impact on agriculture in such an environment because all agricultural activities that are viable in this environment (i.e. low density grazing) can continue completely unhindered underneath transmission lines. Furthermore, the actual footprint of disturbance of the infrastructure constitutes only a negligible proportion of the available land surface area.

Hence, the “no-go” alternative is not a preferred alternative.

3. ENVIRONMENTAL SENSITIVITIES

The layout of the proposed EGI has taken the relevant environmental sensitivities identified by the specialists into consideration. The key environmental features that have been identified are discussed in Section A.5 of this BA Report. The combined environmental sensitivities map is shown in Figure 36.

4. GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME

As part of the 2016 EGI SEA, a generic EMPr was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, Government Notices 162 and 163, for public comment for a period of 45 days. On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, Government Notice 435.

Since the Generic EMPrs have been gazetted and are applicable to the proposed project, the following has been undertaken:

- The Generic EMPrs have been used as a baseline for the proposed project;
- Section 1 of Part B of the gazetted Generic EMPrs contains a template that will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. This section will not be submitted to the DEFF as it has already been gazetted.
- Section 2 of Part B of the gazetted Generic EMPrs has been updated to contain site information, a preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved template in Section 1. This section will be submitted to the DEFF for review and decision-making and has been included in Appendix F of this report.
- Part C of the gazetted Generic EMPr has been compiled and included in Appendix F of this report. It includes site specific impact management outcomes and impact management actions that are not included in the pre-approved generic EMPr.

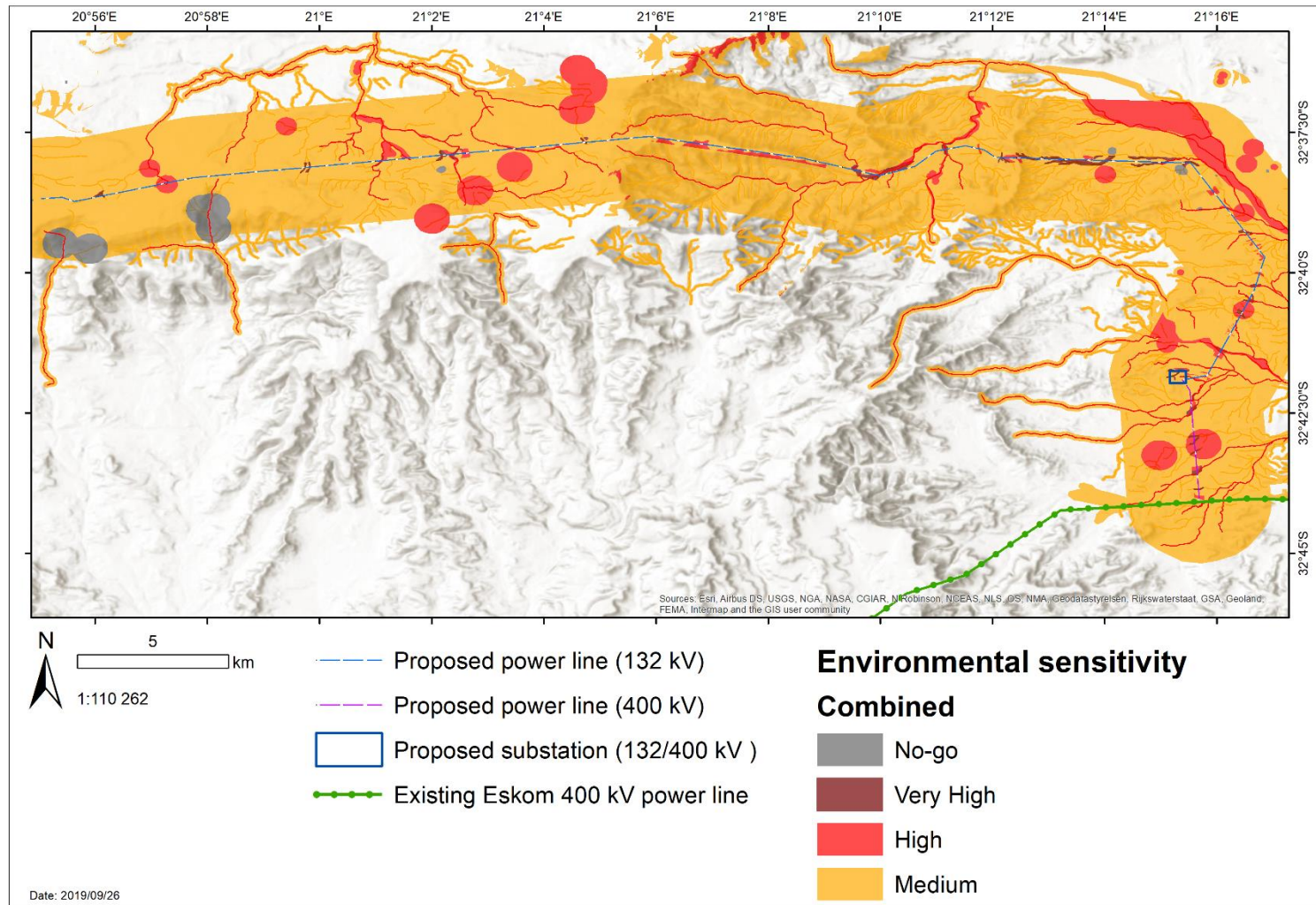


Figure 36: Combined Environmental Sensitivities Map

SECTION E: RECOMMENDATION OF PRACTITIONER

This BA Report has investigated and assessed the significance of potential positive and negative direct, indirect and cumulative impacts associated with the proposed Electrical Grid Infrastructure project. No negative impacts have been identified within this BA that, in the opinion of the EAPs who have conducted this BA Process, should be considered “fatal flaws” from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Based on the findings of the specialist studies, the proposed project is considered to have an overall very low to moderate negative environmental impact. It is expected that the proposed project will also result in a moderate positive socio-economic impact as a result of opportunities during the construction phase. All of the specialists have recommended that the proposed project receive EA and that the recommended mitigation measures are implemented.

As noted above, both Alternative 1 and Alternative 2 of the proposed 132 kV power line routing were assessed in the 2017 - 2018 BA Process. Both alternatives were deemed appropriate and suitable, however Alternative 1 was selected as the preferred routing mainly because it was shorter and contained a smaller extent. However, as part of the 2017 - 2018 BA Process, the specialists confirmed that there are no fatal flaws associated with Alternative 2 of the proposed 132 kV power line, and that it cannot be dismissed as a viable alternative. The proposed project received EA in February 2018 with Alternative 1 approved as the preferred route. However, based on various reasons discussed in Section A of this BA Report, Mainstream have commissioned this BA Process to assess Alternative 2 of the proposed 132 kV power line from the proposed Sutherland on-site substation to a MTS, as well the construction of the MTS, and a 400 kV power line from the MTS to an existing Eskom power line. One of the main reasons for this is because the approved Alternative 1 power line routing was routed to a third-party owned substation, which is yet to be constructed and is dependent on the third-party receiving preferred bidder status. To ensure more stability, Mainstream has therefore decided to commission this BA Process to ensure that the proposed Sutherland, Sutherland 2 and Rietrug WEFs are able to connect to the National Grid in a stable manner that is not dependent on third-parties. This was discussed in detail with the DEFF during the pre-application meeting that took place in May 2019. Appendix I.2 of this BA Report includes the agenda, minutes and signed attendance register of the pre-application meeting.

Based on the findings of the specialist studies, an environmental features and sensitivity map has been produced (and included in Appendix A of this BA Report).

This BA considered the nature, scale and location of the proposed development as well as the wise use of land (i.e. is this the right time and place for the development of this proposed project). When considering the timing of this project, the IRP2010 proposes to secure 17 800 MW of renewable energy capacity by 2030. According to the updated Draft IRP published for comment in November 2018, a total installed capacity of 27 608 MW of Renewable Energy has been planned for by 2030. This includes 4 696 MW for Hydro, 2 912 MW for Pumped Storage, 7 958 MW for Solar PV, 11 442 MW for Wind Energy, and 600 MW for Concentrated Solar Power (CSP). In August 2011, the DOE (now operating as the Department of Minerals and Energy (DME)) launched the REIPPPP and invited potential IPPs to submit proposals for the first 3 725 MW of various renewable energy projects (including solar and wind). In terms of the REIPPPP, Mainstream intends to bid these projects in the subsequent round of the bidding process to be potentially selected as an IPP. The proposed Electrical Grid Infrastructure project is therefore required as part of the bidding process to confirm that the proposed Sutherland, Sutherland 2 and Rietrug WEFs are enabled and equipped with the necessary infrastructure to connect to the national grid. Therefore, overall the proposed Electrical Grid Infrastructure project will fundamentally support and enable the functioning of the proposed Sutherland, Sutherland 2 and Rietrug WEFs and it will ensure that it is allowed to contribute to the abovementioned renewable energy targets proposed by the DME.

The development of wind energy is important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability. On a municipal planning level, the proposed project does not go against any of the objectives set within the Laingsburg Local Municipality IDP (Laingsburg Local Municipality, 2012) and the Karoo Hoogland Local Municipality revised IDP (2016 - 2017) (Karoo Hoogland Local Municipality, 2016). The proposed project will be in line with and supportive of the objectives of the IDP by assisting in local job creation during the construction phase of the project (and ultimately enable job creation as a result of the proposed Sutherland, Sutherland 2 and Rietrug WEFs), if approved by the DEFF. It should however be noted that employment during the construction phase will be temporary.

It should also be re-iterated that the proposed project falls within the gazetted strategic geographic areas of the REDZ 2: Komsberg and Central Power Corridor, and therefore are in line with the objectives of national planning tools.

Taking into consideration the findings of the BA Process, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Sutherland region. The proposed project will play a key role in enabling and facilitating the construction of the proposed Sutherland, Sutherland 2 and Rietrug WEF project, which will add electricity to the national grid. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed project receive EA in terms of the EIA Regulations promulgated under the NEMA.

It is understood that the information contained in this BA Report and appendices is sufficient to make a decision in respect of the activity applied for.

Section 24 of the Constitutional Act states that “everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.” Based on this, the BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the Site Specific EMPr included in Appendix F of this BA Report).

In order to ensure the effective implementation of the mitigation and management actions, the gazetted Generic EMPrs for power line and substation construction compiled by the DEFF will be adopted (as discussed in Section D.4 of this BA Report), and a Site Specific EMPr has been compiled and is included in Appendix F of this BA Report. The mitigation measures necessary to ensure that the project is planned and carried out in an environmentally responsible manner are listed in this EMPr. The EMPr includes the mitigation measures noted in this report and the specialist studies. Listed below are the main recommendations that should be considered (in addition to those in the EMPr and BA Report) for inclusion in the EA (should such authorisation be granted by the DEFF):

- Prior to the commencement of the construction phase, it is recommended that a suitable specialist is appointed to undertake a field reconnaissance (i.e. search and rescue) of the proposed project footprint to identify any floral or faunal components of value or significance that could potentially be impacted by the proposed project and thus need to be relocated or rescued. If any of the species are identified as being protected, then it is essential that the relevant permits required to remove/disturb the species are obtained from the relevant Authorities (i.e. the relocation of any floral or faunal components within the study area should be subject to consideration in terms of prevailing legislation prior to such relocation). Once the permits are obtained, a search and rescue programme must be implemented to allow for the successful transplantation or relocation of these species. It is anticipated that most species should be relocated to points distal from the construction site, but within the same property. In

addition, the Provincial Department of Environment and Nature Conservation, Cape Nature and the Provincial Department of Agriculture, Land Reform and Rural Development (DALRRD) should be contacted to discuss if any protected species are found during the search and rescue.

- A management protocol should be established relating to fauna and the implementation of measures to control the impact of faunal activities on the proposed infrastructure, as well as the impact of the construction and operational phases of the proposed project on the natural environment.
- The footprint required for the proposed project activities must be kept at a minimum. The proposed project footprint must be demarcated to reduce unnecessary disturbance beyond the proposed project area.
- The entire width of the power line servitude should not be cleared of vegetation. Vegetation removal should be kept to a minimum and cleared below the power line and from either side of the centre line based on the requirements of Eskom and standard operating procedures.
- Clearing of vegetation at all impact sites must be kept to an absolute minimum, and strict alien vegetation controls must be implemented throughout all phases of the project. The re-growth of indigenous vegetation must be encouraged following construction.
- Strict erosion control and soil management measures must be implemented during the construction and operational phases, particularly in areas where vegetation has been removed.
- Proper stockpiling must be implemented during all phases of the proposed project in order to prevent erosion and concomitant impacts on the surrounding drainage lines.
- All construction, operational and decommissioning personnel must be made aware of the sensitivity and importance of the surrounding environment. The construction, operational and decommissioning personnel should be made aware and educated of the presence of fauna and bird species and their reliance on sensitive features, in order to avoid disrupting activities and collisions.
- All areas of increased ecological sensitivity should be marked as no-go areas, with recommended buffer areas, and be off limits to all unauthorised construction and maintenance vehicles and personnel.
- Environmental Awareness Training should be carried out at least once-off during the construction and decommissioning phases to ensure that staff are aware of environmental concerns and proper house-keeping recommendations.
- Waste management must be undertaken rigorously during all phases of the proposed project and any non-compliance must be recorded by the ECO. The designated waste stockpiling areas must be inspected frequently to ensure that the integrity is intact and the condition is not compromised. Waste disposal slips and waybills must be kept for all waste disposed at a registered waste disposal facility. As a general principle, waste manifests must be obtained to prove legal disposal of waste. A detailed record must be kept to track the amount of hazardous and general waste being temporarily stockpiled on site. Should the on-site stockpiling of general waste and hazardous waste respectively exceed 100 m³ and 80 m³, and a period exceeding 90 days, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.
- Archaeological and palaeontological mitigation measures stipulated within this BA Report must be implemented during the construction phase. The contact details for SAHRA (for the Northern Cape) and Heritage Western Cape (for the Western Cape) should be included in relevant documents/specifications provided to the Contractor, to ensure that these authorities are

contacted timeously in the event of archaeological material and/or fossils being discovered during construction.

- Any areas not yet surveyed should be examined by both an archaeologist and a palaeontologist (as highlighted in the Heritage Impact Assessment (Appendix D.4 of this BA Report)) in order to identify any areas or sites that should be protected or mitigated prior to commencement of construction.
- The ECO should be aware of the potential for fossils to be uncovered during excavations. As many excavations as possible should be monitored by the ECO during construction and if any fossils are uncovered, they should be protected *in situ* and immediately reported to a palaeontologist in order to plan a way forward.
- The farm road passing through the kraal complex at waypoint 546 in the Northern Cape (as highlighted in the Heritage Impact Assessment (Appendix D.4 of this BA Report)) may not be widened towards the east and should preferably not be widened at all.
- No pylon should be placed within 30 m of waypoint 1785 in the Western Cape (as highlighted in the Heritage Impact Assessment (Appendix D.4 of this BA Report)) and the site should be fenced with a 30 m buffer during the construction phase.
- Significant palaeontological and archaeological sites as listed in the Heritage Impact Assessment (Appendix D.4 of this BA Report) should be identified on project maps and regarded as no-go zones with buffers of at least 30 m around all associated features (the exception is the service road diversion which comes within 20 m of the rock art site but uses an existing farm track). These no-go sites should be examined periodically by the ECO during the construction phase to ensure that they are being respected.
- If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the relevant provincial heritage management authority as soon as possible (i.e. Heritage Western Cape for the Western Cape and SAHRA for the Northern Cape). This may require inspection by an archaeologist or palaeontologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
- Implement an alien vegetation control program and ensure establishment of indigenous species within areas where alien vegetation is identified.
- Rehabilitation of cleared and disturbed areas must be undertaken. Rehabilitation measures should be instituted around the proposed infrastructure that address exotic weed invasion, compaction of soils and maintenance of ecological function.
- A maintenance plan for buildings and structures should be followed to ensure that structures remain as non-reflective as possible. Maintenance of access and service roads should not cause further disturbance and damage to the surrounding landscape.
- The operational monitoring programme must include regular monitoring of the grid connection power line for collision mortalities.
- Prior to construction, an avifaunal specialist should conduct a site walk through, covering the final road and power line routes and pylon positions, to identify any nests/breeding/roosting activity of priority species, as well as any additional sensitive habitats. The results of which may inform the final construction schedule in close proximity to that specific area, including abbreviating construction time, scheduling activities around avian breeding and/or movement schedules, and lowering levels of associated noise. This will also determine if, and where, Bird Flight Diverters (BFDs) are required.

- Install BFDs as per the instructions of the specialist following the site walk through, which may include the need for modified BFDs fitted with solar powered LED lights on certain spans.
- The hardware within the proposed transmission substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site-specific mitigation be applied reactively. If any electrocutions of Red Data avifauna are reported in the proposed transmission substation yard, the avifaunal specialist must be notified for an inspection of the problem and advise on how the problem can be resolved, if at all, through appropriate mitigation.
- For any new infrastructure placed within the watercourses:
 - The structure should not impede or concentrate the flow in the watercourse;
 - The structure should also be placed at the base level of the channel and be orientated in line with the channel;
 - Any rubble or waste associated with the construction works within the aquatic features should be removed once construction is complete; and
 - Water consumption requirements for the site for the construction must be via an authorised water supply.
- For all project related components within the site, any aquatic features of high sensitivity (wetland areas and vernal pools) within the immediate area should be demarcated by the appointed ECO prior to commencement of the construction activities and treated as no-go areas during the construction phase.
- Rehabilitation of any the disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity.
- The relevant authorisations required must be obtained in terms of Section 21 (c) and (i) of the NWA, and in terms of Regulation 509 of 2016 as it pertains to the NWA.

Minnelise Levendal

NAME OF EAP



SIGNATURE OF EAP

01 October 2019

DATE

SECTION F: APPENDICES

The following appendices are attached to this BA Report:

Appendix A	Maps
Appendix B	Photographs
Appendix C	Facility Illustration(s)
Appendix D	Specialist Reports (including Terms of Reference)
Appendix E	Public Participation
Appendix F	Environmental Management Programme (EMPr)
Appendix G	Details of EAP and Expertise
Appendix H	Specialist's Declaration of Interest
Appendix I	Additional Information