



**EMG**

**132 KV GRID CONNECTION  
TRANSMISSION LINE  
BETWEEN THE ORANGE RIVER  
SOLAR FACILITY 1 AND  
ESKOM'S HIGH VOLTAGE  
GROBLERSHOOP  
SUBSTATION, NORTHERN  
CAPE PROVINCE**

Groblershoop, Northern Cape  
Province

Environmental  
Management Group  
(Pty) Ltd.

**Draft Basic  
Assessment  
Report**

## Report details

<b>DFFE reference number:</b>	Pending assessment
<b>Document purpose</b>	<p>This Draft Basic Assessment (Draft BA) Report forms part of a series of reports and information sources that are being provided during the BAR Process for the proposed 132 kV sub-transmission line in Groblershoop, Northern Cape. In accordance with the 2014 NEMA EIA Regulations (as amended), the purpose of the BA Report is to:</p> <ul style="list-style-type: none"> <li>• Present the details of and need for the proposed project;</li> <li>• Describe the affected environment, including the planning context, at a sufficient level of detail to facilitate informed decision making;</li> <li>• Provide an overview of the BA Process being followed, including public consultation;</li> <li>• Assess the predicted positive and negative impacts of the project on the environment;</li> <li>• Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project;</li> <li>• Provide an Environmental Management Programme (EMPr) for the design, construction and operational phases of the project.</li> </ul> <p>The Draft BA Report is being made available to all stakeholders for a 30-day review period. All comments on the Draft BA Report (submitted within the 30-day review period) will be considered in the preparation of the finalised BA Report. This finalised BA Report will then be submitted to the Northern Cape Department of Forestry and Fisheries in accordance with Regulation 19 (1) of the 2017 NEMA EIA Regulations, for decision-making in terms of Regulation 20 of the 2017 NEMA EIA Regulations (as amended).</p>
<b>Project title</b>	132 kV grid connection transmission line between the Orange River Solar Facility 1 and Eskom's high voltage Groblershoop substation, Northern Cape Province
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<b>Address</b>	Destination River Resort
<b>Report Status</b>	Draft Basic Assessment Report
<b>Submission Date</b>	17 January 2023
<b>Development type</b>	3.5 km sub-transmission line (132 kV)
<b>Associated infrastructure</b>	Pylons, overhead transmission line, service roads
<b>Broad scale locality</b>	Groblershoop, Northern Cape Province
<b>Fine scale locality</b>	Boegoeberg Settlement (In Kenhardt) parcel nr 2642 Boegoeberg Settlement (In Kenhardt) parcel nr 2024 Boegoeberg Settlement (In Kenhardt) parcel nr 1315 Boegoeberg Settlement (In Kenhardt) parcel nr 707 GrBoegoeberg Settlement (In Kenhardt) parcel nr 1316 Rooisand 387 portion 18
<b>Site area</b>	<3 ha (linear development)

## Executive summary

### Background:

The Orange River Solar Facility 1 (PTY) Ltd has initiated the development of a 50 MW photovoltaic solar plant located on Portion 18 of the farm Rooisand 387 which is located near the town of Groblershoop, Northern Cape. The project will constitute the construction of the solar plant and associated infrastructure, including an Eskom substation, inverter stations and maintenance building and an internal access road. This development will provide new generation capacity from renewable energy to the national electricity matrix. The proposed solar facility needs to be connected to the national electricity supply grid through ESKOM's Groblershoop high voltage substation which is located on the southwestern side of the Orange River. Due to the importance and need for the solar facility, the proposed 132 kV transmission line is considered to be a crucial component for the success of the solar facility as the powerline connects the solar facility to Eskom's high voltage substation and transmits energy to the national grid. The Orange River Solar Facility 1 have received General Authorisation in terms of Section 22 (1) (a) (iii) of the National Water Act (NWA). With the approval of this Water Use Licence, it will of assistance towards the development of the proposed 132 kV sub-transmission line. The Environmental Authorisation for the Orange River Solar Facility 1 have been received (Reference nr. **14/12/16/3/1/2558**) and the proposed powerline development will contribute to the success of the operation of the Solar Facility.

The Orange River Solar Facility 1 have received General Authorisation for the proposed 132 kV sub-transmission line in terms of Section 22 (1) (a) (iii) of the National Water Act (NWA) (Reference nr. **WU27264**). With the approval of this Water Use Licence, it will have a positive contribution towards the development of the proposed project. The final outstanding component is the development of the powerline between Eskom's high voltage substation and the Orange River Solar Facility 1.

### Project description:

The proposed 132 kV sub-transmission line development will connect the Orange River Solar facility 1 to the Eskom high voltage sub-station, which is located north-west of Groblershoop in the !Kheis local municipality (Northern Cape Province) and falls within the ZF Magcawu District Municipality. The properties to be affected by the proposed development include the following: (**Figure 2**).

Boegoeberg Settlement	(In Kenhardt) parcel nr 2642
Boegoeberg Settlement	(In Kenhardt) parcel nr 2024
Boegoeberg Settlement	(In Kenhardt) parcel nr 1315
Boegoeberg Settlement	(In Kenhardt) parcel nr 707

Boegoeberg Settlement	(In Kenhardt) parcel nr 1316
Rooisand 387	Portion 18

Approximately 3.5 km long, the proposed transmission line will connect the proposed photovoltaic solar facility to the national grid through the selected Eskom sub-station.

Approximately 2.6 km North of Groblershoop, the entrance to the farm Rooisand and Destination River Resort can be found to the left of the N8, a little past the Orange River bridge. Development of the proposed transmission line will affect the vegetation of a roughly 100 m wide servitude footprint area underneath the transmission line (10x10 m<sup>2</sup> on around the foot of the transmission line pylons). Transmission lines require service roads, which would increase the actual area that would be influenced by the proposed development. However, the presence of an existing high voltage transmission line running near parallel to the proposed transmission line has an existing service road. Although existing roads can be used, which lowers the actual area that will be influenced by the proposed development, the development of a service road is still required for the new proposed powerline.

The northern sections of the transmission line will occur on steeply to gently undulating hillsides. Gently inclining floodplains along the orange river mark the southern areas of the transmission line, which experiences less undulating topography.

Specialist studies have been conducted for the site as follows:

- Aquatic Ecological Assessment – *AJH Lambrecht* (EcoFocus Consulting Services)
- Phase 1 Heritage Impact Assessment – *Dr L Rossouw*
- Avifaunal Impact Assessment – *Mr. J van Niekerk*
- Terrestrial Ecological Impact Assessment - *Ms. E Ferreira and Mr. R Nel*
- Visual Impact Assessment - *Mr. M van den Berg*

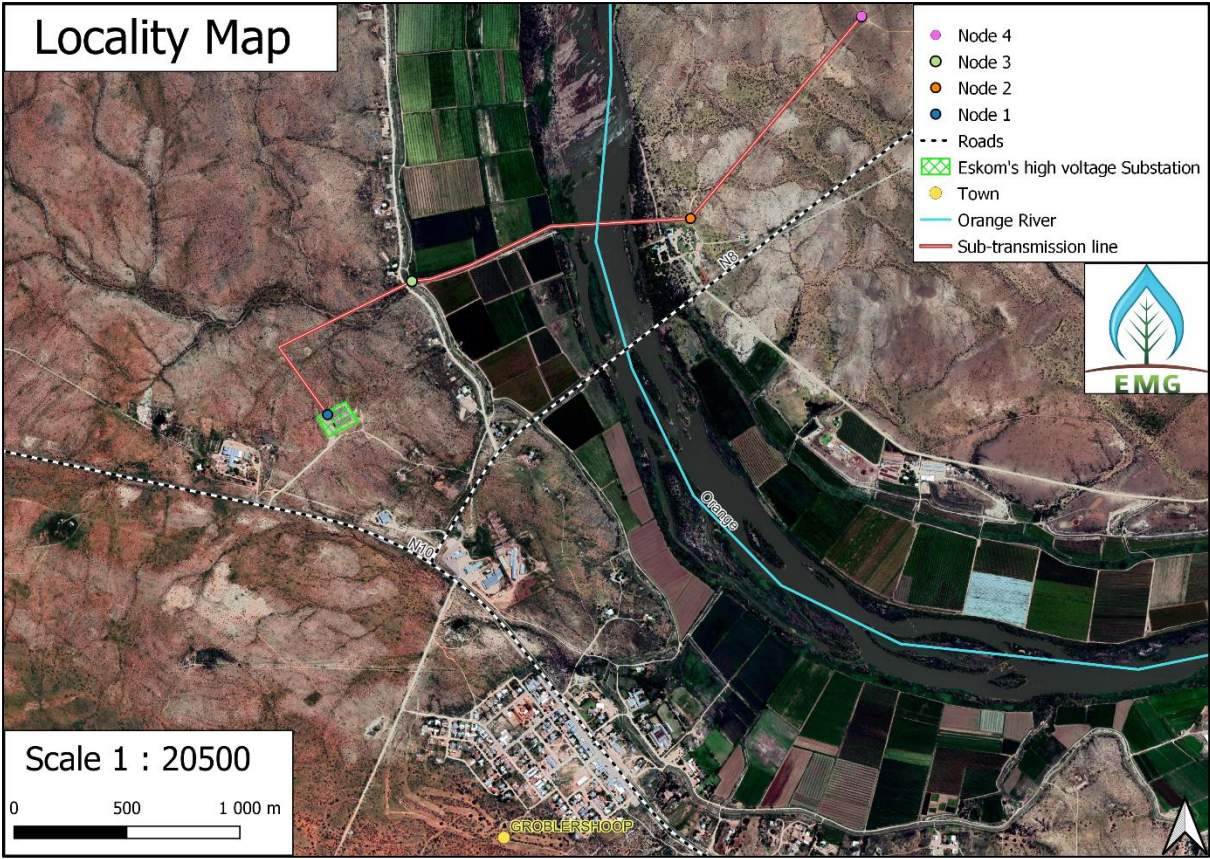








Figure 1:Map illustrating the locality of the proposed 132kV power line.

## **Basic Assessment report process (BAR):**

Orange River Solar Facility 1 (Pty) Ltd has appointed Environmental Management Group (Pty) Ltd as the independent environmental assessment practitioner to undertake the Basic Assessment (BA) for the proposed Groblershoop 132 kV sub-transmission line. The BA process is being undertaken in accordance with the requirements of the EIA Regulations of 2014 (as amended), promulgated in terms of the National Environmental Management Act (NEMA: Act No. 107 of 1998).





The main objectives of this BA Report include the following;







-  Provide a description of the proposed project, including the legislative context and project motivation.
-  Identify and describe applicable alternatives for the proposed project.
-  Identify and describe the anticipated environmental, social, economic, and cultural impacts, including cumulative impacts, associated with the proposed development and outline key issues and specialist studies, included within the BAR process to assess these issues in further detail.
-  Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.
-  Describe the process of engagement with identified stakeholders, including their views and concerns;
-  Registration of the I&AP's; and

This report represents the draft version of the Basic Assessment Report that will be made available for public comment. As per the requirements of the NEMA EIA Regulations (2014, as amended), this Draft Basic Assessment Report has been issued for public participation in terms of GNR 326, Regulation 43. All Interested and Affected Parties (I&APs) are required to register as stakeholders to enable them to comment during this Public Participation Process (PPP). This PPP provides an opportunity to comment and raise any concerns or suggestions in respect of the project. All comments received during the PPP will be recorded and addressed within the Final BA Report.

This Final BA Report will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE), as stipulated by the NEMA EIA Regulations (2014, as amended).

In summary, the Draft BA Report includes the following:

-  Details of the Environmental Assessment Practitioner (EAP);
-  Location of the proposed development;
-  Plan which locates the proposed activity or activities applied for at an appropriate scale;
-  Description of the scope of the proposed activity;

-  Description of the policy and legislative context applicable to the proposed development;
-  Description of the need and desirability for the proposed development;
-  Description of the potential environmental issues and impacts which have been identified to date;
-  Full description of the process followed to reach the proposed preferred activity, site, and location within the site; and
-  Public Participation Report outlining the comments and responses of the 30day public participation process of the Draft Basic Assessment Report.
-  Undertakings under oath or affirmation by the Environmental Assessment Practitioner (EAP).

## **Summary of impacts**

**Specialist assessments were conducted for the proposed Project and a summary of the findings have been included below:**

### **Avifaunal Impact Assessment**

Based on the Avifaunal Impact Assessment conducted, the ORSF1 power line will be a permanent collision hazard to the area's birds, probably for decades. The proposed power line route intersects several flyways and passes near a known roost, as well as another spot in the Orange River that is likely to attract large numbers of birds during certain times of the year. There is thus, a high probability that collisions will occur. It is estimated that 234 avifauna species overlap within the study area. 15 Red Data species although their use of the footprint area is provisionally considered to be mainly transitory and only two Red Data species are considered relatively common in the area (Abdim's Stork and the Lanner falcon). 18 endemic species occur within the footprint of the study area, which include four Red Data species, and only the following species are probable residents in the footprint area:

- Karoo Korhaan,
- Karoo Thrush,
- Karoo Scrub Robin,
- Namaqua Warbler,
- Fiscal Flycatcher and
- Fairy Flycatcher.

A total of 205 other species may utilise the footprint area.



## **Freshwater Impact Assessment**

A site assessment for the proposed linear development area was conducted on 13 October 2022. This date forms part of the commencement of the new growing season. At the time of the site assessment, the area had however not received any initial rainfall yet. It must therefore be noted that the timing of the assessment was not necessarily favourable for successful identification of all plant species individuals.

- The significant watercourses scored a moderate Ecological Importance and Sensitivity (EIS) value and are viewed as being of moderate conversational significance/value for habitat preservation and ecological functionality persistence in support of the surrounding ecosystem, Critical Biodiversity Area one and two (CBA 1 & 2) as well as the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area.
- Once the construction phase of the proposed development has been completed, the subsequent operational phase should not result in any significant additional potential aquatic ecological impacts, apart from the potential long-term aquatic ecological impacts.
- The significant potential long-term aquatic ecological impacts identified for the proposed development, could potentially merely add low to moderate cumulative impact to existing negative impacts caused by the extensive existing agricultural cultivation transformation, along the local and broader length of the Orange River.

## **Phase One Heritage Impact Assessment**

Impact on potential palaeontological heritage resources within floodplain deposits (alluvium, left & right bank of the river) is considered low as it has been severely degraded by modern farming and commercial activities.

- No evidence was found of in situ Stone Age archaeological material, either as capped assemblages or distributed as intact surface scatters on the landscape within the boundaries of the proposed linear development. Low density (< 1 / 100 m) isolated finds include weathered, cf. LSA flakes and associated debitage made on banded ironstone.
- There are no indications of rock art (engravings), stonewalled structures or historically significant buildings older than 60 years, or aboveground evidence of graves or cairns within the boundary of the proposed linear footprint.
- Given the nature of the underlying geology, potential impact on rock engraving sites within the study area is considered unlikely.

The proposed development footprint and associated access road are not considered palaeontologically or archaeologically vulnerable and is assigned a site rating of Generally Protected C.

## **Visual Impact Assessment**

- A very high risk of cumulative impacts is likely as the powerline route is also shared with other existing powerlines in the same corridor. The proposed powerline will increase the visual dominance of power infrastructure, thereby compounding the negative effect on views towards valued landscape features and reducing scenic quality of the landscape character.
- The landscape character will experience a transformation as a result of the new powerline. The completed project will introduce a new 4km powerline to a landscape that is valued for its natural beauty and picturesque agricultural land use. These features are central to the sense of place and the scenic quality of the study area.

No fatally flawed impacts are identified, but the significance of impact on the highly sensitive landscapes, are considered major and require mitigation intervention to prevent further loss in scenic quality and visual value.

## **Terrestrial Ecology Impact Assessment**

The site consists of multiple vegetation units with varying overall vegetation layer characteristics. Within the study area, nine homogeneous vegetation units were identified. Overall, the tree layer is moderately to well-developed in certain areas while absent in others. The shrub layer is moderately developed throughout the site. The tall shrub layer is absent in some vegetation units while moderately developed in others. On the other hand, the dwarf shrub layer is moderately to well-developed consistently throughout the site. Poor to moderately developed graminoid and herbaceous layers are consistent throughout the study area.

Located within the remaining extent of NKb3 and AZa3 vegetation types, the development area is also located within a CBA 2 area and borders a CBA 1 area. Thus, the study area falls in an area that requires conservative management (SANBI, 2017). The following species of conservation concern have been identified:



Table 1: List of species of conservational concern identified and their protection level









Family	Species	Red list status	Protection level
<b>Capparaceae</b>	<i>Boscia albitrunca</i>	LC	NCNCA (2009), Schedule 2 NFA (1998)
<b>Fabaceae</b>	<i>Vachellia erioloba</i>	LC	NFA (1998);
<b>Aloaceae</b>	<i>Aloe claviflora</i>	LC	NCNCA (2009), Schedule 2
<b>Aloaceae</b>	<i>Aloe hereroensis</i>	LC	NCNCA (2009), Schedule 2
<b>Asphodelaceae.</b>	<i>Haworthiopsis tessellata</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia braunsii</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia gariiepina</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia gregaria</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia spinea</i>	LC	NCNCA (2009), Schedule 2
<b>Iridaceae</b>	<i>Gladiolus permeabilis</i>	LC	NCNCA (2009), Schedule 2
<b>Meliaceae</b>	<i>Nymannia capensis</i>	LC	NCNCA (2009), Schedule 2
<b>Fabaceae</b>	<i>Lessertia Pauciflora.</i>	LC	NCNCA (2009), Schedule 1

Overall anticipated environmental impact evaluation has indicated that the development would have a low anticipated environmental impact. A low environmental impact was quantified by the proposed transmission lines' few direct impacts within the study area.

### Summary of mitigations

The recommended mitigations are as follows:

-  Vegetation clearance must be restricted to the pylon locations and the narrow linear route of the proposed transmission line access/service road, as far as practicably possible.
-  It is recommended that all individuals of the identified alien invasive species must be actively eradicated from the Orange River riparian zone and the relevant watercourse, in accordance with the requirements of the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Removed materials must also be adequately and lawfully disposed of, in order to prevent potential further spreading/dispersal.

-  It is recommended that no pylons may be constructed within the Orange River riparian zone. This must be done in order to prevent significant disturbance of the riparian zone and its associated conservationally important and locally distinct faunal habitat and to subsequently maintain/ensure the ecological functionality and -integrity of the riparian zone, over time.
-  It is recommended that the pylons on the eastern and western sides of the Orange River to cross the river, be placed parallel with the existing pylon locations of the existing ESKOM line, as these have been constructed a suitable distance away from the riparian zone.
-  It is furthermore recommended that the transmission line be suspended as high as practicably possible across the Orange River and that adequate bird deflecting/deviation technologies be implemented along the transmission line. This must be done in order to attempt to prevent significant collision- and mortality risks to waterbirds and other avifauna that utilise the river.
-  It is recommended that no pylons may be constructed inside- or within 35 m of any significant watercourse. The development design layouts of the proposed transmission line must allow for continued flow through the watercourses. This must be done in order to maintain/ensure their ecological functionality and - integrity over time.
-  It is recommended that no pylons may be constructed inside- or within 20 m of any preferential water flow path/drainage line. The development design layouts of the proposed transmission line must allow for continued flow through the flow paths/drainage lines. This must be done in order to maintain/ensure their ecological functionality and -integrity over time.
-  It is recommended that the pylons be placed parallel with the existing pylon locations of the existing ESKOM line, as far as practicably possible, as these have been constructed a suitable distance away from the watercourses and flow paths/drainage lines.
-  Disturbed areas within and immediately surrounding the proposed Orange River-, watercourse- and flow path/drainage line crossings, must be adequately rehabilitated concurrently with the construction processes. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.
-  An adequate Stormwater and Erosion Management Plan must also be implemented during the construction- and operational phases of the proposed development, in order to assist with and allow for continued flow within the local catchment. This must be done to sufficiently manage storm water runoff and clean/dirty water separation in order to attempt to maintain/ensure the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area.

### **EAP's Recommendations**

The EAP(s) recommends that the proposed 132 kV sub-transmission line be authorized at the proposed location. All mitigation measures listed by the specialists in their specialist reports and proposed in the Environmental Management Programme (EMPr) must be implemented.

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## Glossary of terms and acronyms






Term	Explanation
<b>BAR</b>	Basic Assessment Report
<b>CEA</b>	Cumulative Effects Assessment
<b>DFFE</b>	Department of Environment, Forestry and Fisheries
<b>DM</b>	District Municipality
<b>DoE</b>	Department of Energy
<b>DWS</b>	Department of Water and Sanitation
<b>EA</b>	Environmental Authorisation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	Environmental Impact Assessment
<b>EMPr</b>	Environmental Management Programme
<b>EP</b>	Equator Principles
<b>EPFI</b>	Equator Principles Financial Institutions
<b>Environmental impact</b>	Any change to the environment, whether adverse or beneficial, wholly, or partially resulting from a development and or the operation thereof.
<b>GNR</b>	Government Notice Regulation
<b>I&amp;AP</b>	Interested and affected party
<b>IDP</b>	Integrated Development Plan
<b>IFC</b>	International Finance Corporation
<b>IPP</b>	Independent Power Producer
<b>kV</b>	Kilo Volt
<b>kph</b>	Kilometre Per Hour
<b>Mitigate</b>	Activities designed to lessen/compensate for unavoidable environmental impacts.
<b>MW</b>	Megawatt
<b>NEMA</b>	National Environmental Management Act No. 107 of 1998
<b>NERA</b>	National Energy Regulator of South Africa
<b>NWA</b>	National Water Act No. 36 of 1998
<b>LM</b>	Local Municipality
<b>PPP</b>	Public Participation Process
<b>PV</b>	Photovoltaic
<b>REDz</b>	Renewable Energy Development zones

<b>SAHRA</b>	South African Heritage Resources Agency
<b>SDF</b>	Spatial Development Framework
<b>SPP</b>	Solar Power Plant
<b>VAC</b>	Visual Absorption Capacity
<b>VU</b>	Vegetation Unit
<b>ZMVE</b>	Zone of Maximum Visual Exposure
<b>ZVI</b>	Zone of Visual Influence

# 1. Introduction

## Document purpose:

This Draft Basic Assessment (Draft BA) Report forms part of a series of reports and information sources provided during the BA Process for the proposed 132 kV sub-transmission line in Groblershoop, Northern Cape. In accordance with the 2014 NEMA EIA Regulations (as amended), the purpose of the BA Report is to:

-  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;
-  identify the alternatives considered, including the activity, location, and technology alternatives;
-  describe the need and desirability of the proposed alternatives;
-  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—
  - the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - the degree to which these impacts—
    - can be reversed;
    - may cause irreplaceable loss of resources; and
    - can be avoided, managed or mitigated; 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—
  - identify and motivate a preferred site, activity and technology alternative;
  - identify suitable measures to avoid, manage or mitigate identified impacts; and
  - identify residual risks that need to be managed and monitored.

The Draft BA Report is available to all stakeholders for a 30-day review period. All comments on the Draft BA Report (submitted within the 30-day review period) will be considered in the preparation of the finalised BA Report. Environmental Management Group (Pty) Ltd. will then submit the BA Report to the DFFE in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations for decision-making in terms of Regulation 20 of the 2014 NEMA EIA Regulations (as amended).

## The Environmental Assessment Practitioner:

According to Appendix 1, Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include “(a) details of—

- (i). *the EAP who prepared the report; and*
- (ii). *the expertise of the EAP, including a curriculum vitae.”*

Environmental Management Group (PTY) Ltd. (EMG) is an active company working in conjunction with other private companies, government departments, municipalities and parastatals to promote sustainable development and sound environmental management principles. EMG was appointed by the applicant to facilitate the environmental authorisation process for the proposed powerline development. The lead environmental assessment practitioner (EAP) for the proposed development is Mr. SE van Rooyen.

A detailed *curriculum vitae* (CV) of the lead EAP is presented in **Appendix B**. Refer to the bellow summary for a brief overview of qualifications, registrations and associations held by the lead EAP.













Table 2 Summary of associations, registrations and qualifications held by the lead EAP.







<b>Lead EAP name</b>	Mr. SE van Rooyen
<b>Contact information</b>	☎ +27 51 412 6350/ 083 678 3032 ✉ svr@envmgrp.com
<b>Company</b>	Environmental Management Group (Pty) Ltd.
<b>Role(s)</b>	Director, and Senior Environmental Assessment Practitioner
<b>Qualifications</b>	BSc Environmental and Biological Sciences
<b>Professional registrations</b>	EAPASA: 2019/309; SACNASP: 116554; IAIA 5901

### The team of experts:

The compilation of this BA required the expertise and knowledge of various specialists in the fields of terrestrial and aquatic ecology, palaeontology, anthropology, and ornithology. Experts in these fields were appointed for the compilation of specialist reports which reported on the *in-situ* condition of the receiving environment and the anticipated impacts associated with the proposed development. Specialists were commissioned to undertake the relevant assessments to identify and assess impacts and propose appropriate mitigation and management measures for the identified impacts. The specialist assessments, that were commissioned include:

Table 3 Summary of relevant qualifications and registrations held by the team of experts.

Specialist member	Type of Assessments	Qualifications and registrations
<b>Mr. AJH Lamprecht</b>	Aquatic Ecological Assessment	<ul style="list-style-type: none"> <li> MSc environmental science (ecological remediation and sustainable development)</li> <li> BSc Botany and Zoology</li> <li> South African Council for Natural Scientific Professions Reg: 115601 South African Wetland Society Reg: 220958</li> </ul>
<b>Mr. R Nel</b>	Terrestrial Ecological Assessment	<ul style="list-style-type: none"> <li> BSc Botany and Zoology</li> <li> BSc (Hons) Vegetation ecology</li> <li> South African Council for Natural Scientific Professions (SACNASP) in Ecological Science (Cand. Sci. Nat. 144943</li> </ul>
<b>Dr. L Rossouw</b>	Phase one Heritage Impact Assessment	<ul style="list-style-type: none"> <li> B.A. (Hons.) Archaeology</li> <li> M.Sc. Quaternary Vertebrate Palaeontology (cum laude)</li> <li> Ph.D Plant Sciences, Dept. of Plant Science</li> <li> Member of Association for South African Professional Archaeologists (ASAPA)</li> <li> Member of Palaeontological Society of Southern Africa (PSSA)</li> </ul>
<b>Mr. M van den Berg</b>	Visual Impact Assessment	<ul style="list-style-type: none"> <li> ML(Prof) (Landscape Architecture)</li> </ul>

		 B.SC Hons (Landscape Architecture)  B.Sc, (Landscape Architecture)
<b>Mr. J van Niekerk</b>	Avifaunal Impact Assessment	 B. Sc. (Biochemistry and Zoology).  B. Sc. Honours in Zoology.  M. Sc. in Zoology with distinction.  Ph. D. in Zoology.



## 2. Project introduction

### Project Background

The Orange River Solar Facility 1 (PTY) Ltd has initiated the development of a 50 MW photovoltaic solar plant located on Portion 18 of the farm Rooisand 387 which is located near the town of Groblershoop, Northern Cape. The project will constitute the construction of the solar plant and associated infrastructure, including an Eskom substation, inverter stations and maintenance building and an internal access road. The location of the solar facility can be seen in the **Figure 2** below. This development will provide new generation capacity from renewable energy to the national electricity matrix. The proposed solar facility needs to be connected to the national electricity supply grid through ESKOM's Groblershoop high voltage sub-station which is located on the southwestern side of the Orange River. Due to the importance and need for the solar facility, the proposed 132 kV transmission line is considered to be a crucial component for the success of the solar facility as the powerline connects the solar facility to Eskom's high voltage substation and transmits energy to the national grid. The Environmental Authorisation for the Orange River Solar Facility 1 have been received (Reference nr. **14/12/16/3/1/2558**) and the proposed powerline development will contribute to the success of the operation of the Solar Facility.

The Orange River Solar Facility 1 have received General Authorisation for the proposed 132 kV sub-transmission line in terms of Section 22 (1) (a) (iii) of the National Water Act (NWA) (Reference nr. **WU27264**). With the approval of this Water Use Licence, it will have a positive contribution towards the development of the proposed project.

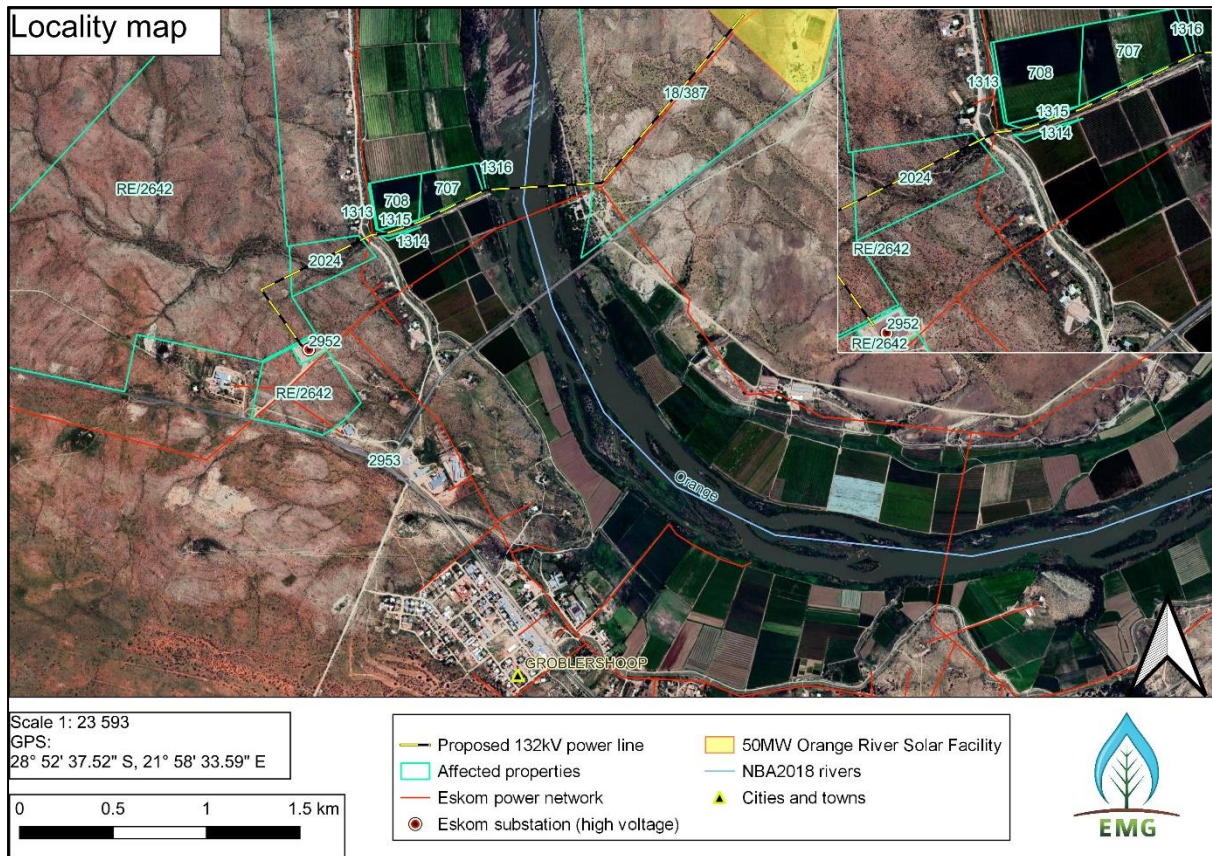


Figure 2: Map indicating the proposed solar facility and powerline development site on farm Rooisand 387/18 in relation to Groblershoop

**This report solely focuses on the construction of the 132 kV sub-transmission line, although reference would be made to the solar facility throughout this report.**

**Project Description:**

Orange River Solar Facility 1 (PTY) Ltd has introduced the process for the construction of a 132 kV sub-transmission line which will connect the proposed solar facility to Eskom’s high voltage substation. The proposed development is situated approximately 3 km (north) from the Central Business District of Groblershoop, Northern Cape. The powerline will be 3.5 km in length running near parallel to an existing high voltage transmission line. The distance between the proposed and existing transmission lines may vary between 50 m to 75 m and the distance between the proposed powerline pylons ranges from 200m up to 375m depending on the ground profile.

The proposed 132 kV sub-transmission line will affect the following properties:

Table 4:A list of the properties to be affected by the proposed development

Boegoeberg Settlement	(In Kenhardt) parcel nr 2642
Boegoeberg Settlement	(In Kenhardt) parcel nr 2024
Boegoeberg Settlement	(In Kenhardt) parcel nr 1315
Boegoeberg Settlement	(In Kenhardt) parcel nr 708
Boegoeberg Settlement	(In Kenhardt) parcel nr 707
Boegoeberg Settlement	(In Kenhardt) parcel nr 1316
Rooisand 387	portion 18

This facility is located near Groblershoop, Northern Cape. The project will constitute the construction of the sub-transmission line and associated supporting infrastructure. Associated infrastructure which will be developed include pylons and service roads.

The estimated physical clearance is to some extent difficult to accurately determine considering the development's low intensive and linear nature. Physical clearance will be restricted to pylon placement, trampling of vegetation via vehicle movement, and the circumstantial instalment of service roads. Based on the information provided to the EAP, the pylon footprint / laydown structures ranges from 0.6 x 0.6m to 1.5m x 1.5m with the larger footprint associated with the guyed suspension and angle strain pole as bend/ strain structures. Refer to the figure below (**Figure 3**) for a visual reference to the existing powerline. It's important to note that the design specifications of the proposed powerline's pylons will be similar to the existing 132 kV transmission line. The operational requirements of powerlines necessitate the instalment of service roads. These roads are typically less than 8 m wide and is used for maintenance purposes. The proposed powerline development's proximity to the existing powerline allows for the sharing of service roads. By sharing the existing powerline's service road, the actual clearance will be limited. In some areas of limited access, a new service road will be developed by clearing an approximate 8 m wide stretch of vegetation. If assumed service roads will be laid down along the whole powerline's layout, the total clearance will be less than 3 ha. It's important to note that the clearance of 3 ha is highly unlikely as existing service roads will be utilised and clearance near the Orange River's riparian vegetation will be greatly limited.



*Figure 3: An aerial photograph of the existing 132 kV transmission line's pylon. Note the vegetation growing around this pylon, indicating the minimal disturbance required for the instalment of such structures. The small service road is also visible in this view.*

## Single Circuit (SCt) Guyed Structures

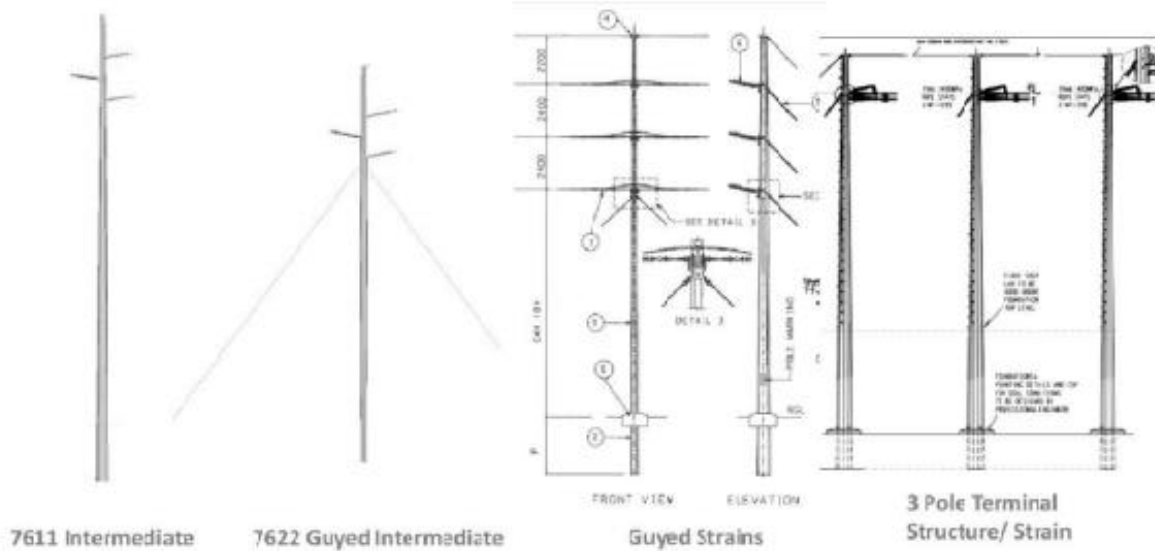







Figure 4: Structure layout of the powerline development

Construction of the proposed powerline will include the following:

-  Pylons
-  Service roads
-  Anti-nesting devices
-  Bird perches to all structure tops
-  Bird flight diverters on optical ground wires

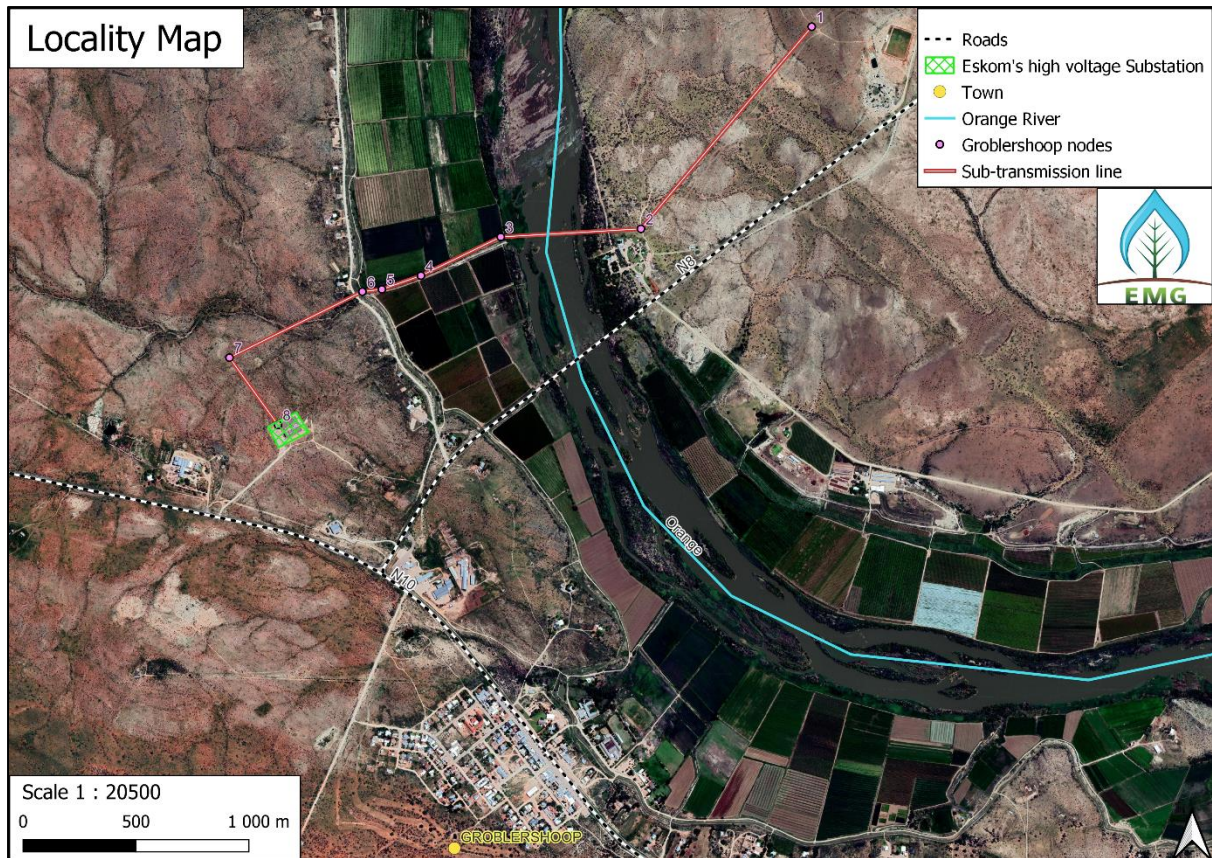


Figure 5: Map illustrating the locality and nodes of the proposed 132kV power line.

The table below (Table 5) provide the coordinates of the nodes of the transmission line highlighted in **Figure 5** above.

Table 5: Node coordinates of the Groblershoop proposed 132kV transmission line. Refer to **Figure 3** for a visual representation of the site and transmission line's overall layout.

Co-ordinates:	Latitude (S):			Longitude (E):		
Site 1						
Node 1	24°	48'	72.7"	33°	58'	62.9"
Node 2	24°	47'	86.3"	33°	59'	65.0"
Node 3	24°	47'	15.5"	33°	59'	69.1"
Node 4	24°	46'	75.1"	33°	59'	88.7"
Node 5	24°	46'	55.3"	33°	59'	95.6"
Node 6	24°	46'	45.4"	33°	59'	96.8"
Node 7	24°	45'	78.3"	33°	60'	30.1"
Node 8	24°	46'	02.8"	33°	60'	64.1"

### 3. Legislative context

#### Introduction

According to Appendix 1 Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include “(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) (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;”

The proposed development is subject to various legislative requisites in relationship with the South African environmental law. This section provides a brief overview of relevant legislation and their applicability to the proposed development. The proposed development's construction and operation must adhere to all applicable legal requirements pertaining to environmental management. The following acts and policies and their relevance to the proposed development are briefly summarised:

-  The Constitution of South Africa Act, 1996 (Act No. 108 of 1996);
-  National Environmental management: Air Quality Act, 39 (Act 39 of 2004);
-  National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended
-  National Environmental Biodiversity Act, 2004 (Act No. 10 of 2004);
-  The National Water Act, 1998 (Act No. 36 of 1998);
-  The White Paper on Integrated Pollution and Waste Management for South Africa;
-  Environmental Conservation Act, (Act No .73 of 1989);
-  Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);
-  The National Heritage Resources Act (Act 25 of 1999);
-  The National Forest Act (Act No. 84 of 1998):
-  The Northern Cape Nature Conservation Act (Act No. 9 of 2009);
-  National Environmental Management Act (Act No. 107 of 1998);
-  Environmental Impact Assessment Regulations, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998); and
-  Renewable Energy Development Zones (REDZs).

### **3.1. The Constitution of South Africa Act, 1996 (Act No.108 of 1996):**

The Constitution is the supreme law of the Republic, and all law and conduct must be consistent with the Constitution. The Bill of Rights emphasises several provisions relevant to securing the protection of the environment. Section 24 states that “Everyone has the right –

- a) *To an environment that is not harmful to their health or well-being; and*
- b) *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*
  - i). *prevent pollution and ecological degradation;*
  - ii). *promote conservation; and*
  - iii). *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

The Constitution, therefore, compels the government to give effect to the people's environmental rights and places the government under a legal duty to act as a responsible custodian of the country's natural environment. The Constitution compels the government to pass legislation which protects the environment, prevents pollution and ecological degradation, promotes conservation, and secures sustainable development.

The proponent must ensure that the proposed development does not contravene the Constitution by ensuring that no pollution or ecological degradation results from the activities undertaken and by undertaking the development in an ecologically sustainable manner.



**Note:** It is however important to note that though an activity may be allowed in terms of an Act of Parliament, or a permit issued under a statute, it may still be declared unlawful if it is harmful to human health or well-being.

#### **Relevance to the proposed development:**

The proponent must ensure that the proposed development's construction or operation does not contravene the Constitution. The proponent should comply with the Constitution by providing that no pollution or ecological degradation occurs due to the proposed development and by conducting environmentally sustainable developmental practices.

### **3.2. National Environmental Management: Air Quality Act, 39 (Act No. 39 of 2004):**

The National Environmental Management: Air Quality Act 39 of 2004 provides for the setting of national norms and standards for regulating air quality monitoring, management and control and describes specific air quality measures to protect the environment and human health or well-being by:

-  Preventing pollution and ecological degradation; and
-  Promoting sustainable development through reasonable resource use.










The National Environmental management: Air Quality Act also includes reference to the control of offensive odours whereby reasonable steps to prevent the emission of any offensive odours caused by activities on a premises are required. Also relevant is the establishment of national ambient dust fall out levels that may be relevant to the construction and operation of the solar plant.

**Relevance to the proposed development:**

The proposed sub-transmission line does not trigger registration or licensing in terms of this Act, however during the construction phase, generation of dust and noise could become a factor to surrounding land users. However, it remains the proponent's responsibility to remain within the acceptable limits as stipulated in the NEM:QA (Act No. 39 of 2004)

**3.3. National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), as amended:**

The National Environmental Management: Waste Act (NEM:WA) aims to reform the law regulating waste management to protect health and the environment. This is achieved by:

-  Providing reasonable measures for the prevention of pollution, ecological degradation and, securing ecologically sustainable development;
-  providing for the national norms and standards for regulating the management of waste by all spheres of government;
-  providing for specific waste management measures;
-  providing for the licensing and control of waste management activities;
-  providing for the remediation of contaminated land;
-  providing for the national waste information system; and
-  providing for compliance and enforcement thereof.






The NEM:WA indicates that certain waste management activities must be licensed, and according to Section 44 of the Act, the licensing procedure must be integrated with an environmental impact assessment process per the EIA Regulations promulgated in terms of the NEMA. Government Notice 921, published in Government Gazette No. 37083, on 29 November 2013, lists the waste management activities that require licensing. A distinction is made between Category A waste management activities, which require a Basic Assessment, and Category B waste management activities, which require the S&EIr process to be followed.

**Relevance to the proposed development:**

The construction and operation of the proposed sub-transmission line are not subjected to any activity as listed in Category A or B of NEM:WA, 2008 and the updated Waste Act in 2013, and therefore a Waste Licence is not required. It is important for contractors to be appointed and the construction manager to take cognisance of Category C of the Waste Act and its associated norms and standards. It is also recommended that a waste management plan be compiled for the construction and operational phases of the plant. The waste management plan must also promote the re-use and recycling of materials.

### **3.4. The National Environmental Biodiversity Act, 2004 (Act no. 10 of 2004):**

National Environmental Biodiversity Act, 2004 (Act No. 10 of 2004): The Biodiversity Act provides for the conservation and management of South Africa's biodiversity. It has been developed in alignment with NEMA for the conservation of species and ecosystems that warrant national protection, sustainable use of indigenous biological resources and fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources. By recognising that biodiversity conservation must also occur outside of protected areas, the Biodiversity Act introduces tools including:

-  Development of a National Biodiversity Framework (NBF)
-  Development and publishing of bioregional plans to map and identify Critical Biodiversity Areas (CBAs); and provide guidelines for land-use planning and decision-making in these areas.
-  Development and publishing of Biodiversity Management Plans (BMP) for an ecosystem, an indigenous species, or a migratory species.
-  Publishing of threatened ecosystems and species in the Government Gazette, and the requirement for permits for carrying out a restricted activity involving a threatened species.
-  Prevention of the spread, and eradication of, invasive alien species.

#### **3.4.1. Threatened or protected ecosystems and species:**

NEMBA states that biodiversity loss through habitat loss, degradation or fragmentation must be avoided, minimised, or remedied. The loss of biodiversity includes the loss of threatened or protected species and the loss of localised endemics. Chapter 4 of the NEM:BA deals with threatened or protected ecosystems and species, and its purpose is "to—

- a) provide for the protection of ecosystems that are threatened or in need of protection to ensure the maintenance of their ecological integrity;*
- b) provide for the protection of species that are threatened or in need of protection to ensure their survival in the wild;*
- c) give effect to the Republic's obligations under international agreements regulating international trade in specimens of endangered species; and*
- d) ensure that the utilisation of biodiversity is managed in an ecologically sustainable way."*

Aspects concerning the loss of biodiversity through the loss of localised endemics, the loss of localised species diversity, the loss of ecological functions which support biodiversity, and the loss of threatened and/or protected species are discussed in the ecological assessment report (**Appendix H**).

### 3.4.2. Bioregional spatial planning:

CBA Maps are provided with formal legal status through the National Environmental Management: Biodiversity Act (Act 10 of 2004), which introduced several new legislative tools to assist with conserving and managing South Africa's biodiversity. One of these is the declaration of "bioregions" and the publication of bioregional plans. Guidelines for the development of bioregional plans were developed by SANBI at DFFE's (then DEA) request and were published in the Government Gazette in 2009 as the "Guideline regarding the determination of bioregions and the preparation and publication of bioregional plans", referred to for short as the Guideline for Bioregional Plans (DEAT, 2009).

According to the Guideline for Bioregional Plans, the purpose of a bioregional plan is to provide a map of CBAs and ESAs with accompanying land-use guidelines, to inform land-use planning, environmental assessment and authorisations, and natural resource management by a range of sectors whose policies and decisions impact on biodiversity. A CBA Map is thus the core component of a bioregional plan. See below a summary of conceptual framework for CBA maps.

Table 6: Conceptual framework for CBA maps











Map category	Landscape-level purpose	Broad management objective
Protected areas	Formal long-term protection for important biodiversity and landscape features. Together with CBAs, ensures that a viable representative sample of all ecosystem types and species can persist.	Must stay in largely natural ecological condition. Details determined by the management plan that is required for each protected area.
<b>CBA:</b> Critical Biodiversity Areas	Together with protected areas, ensures that a viable representative sample of all ecosystem types and species can persist.	Must stay in largely natural ecological condition.
<b>ESA:</b> Ecological Support Areas	Ensures the long-term ecological functioning of the landscape as a whole.	Must retain ecological processes, which often requires at least semi-natural ecological condition.
<b>ONA:</b> Other Natural Areas	Allows for range of other land uses, including intensive land uses.	Determined by other spatial planning tools (e.g. SDFs).
<b>NNR:</b> Areas with No Natural Habitat Remaining	Areas already severely or irreversibly modified by intensive land uses.	Determined by other spatial planning tools (e.g. SDFs).

#### **Relevance to the proposed development:**

Several biologically focused specialist studies were conducted to assess the potential impact derived from the proposed development. These assessments are crucial in the EIA process and should provide relevant mitigation measures, aiming to lower the overall environmental impact. See the various specialist assessments in **Appendix H** and the impact assessment in **section 9**. The proponent is to remain responsible for low-impact developmental practices, flora removal, and relocation permit acquisition.

#### **3.5. The National Water Act, 1998 (Act No. 36 of 1998):**

The National Water Act (NWA) administered by DWS aims to manage and protect the national water act resources to achieve sustainable use of water for the benefit of all water users. The purpose is to achieve sustainable use of water for the benefit of all water users. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in ways that consider:

-  Promoting equitable access to water;
-  Redressing the results of past racial discrimination;
-  Promoting the efficient, sustainable, and beneficial use of water in the public interest;
-  Facilitating social and economic development;
-  Providing for the growing demand water use;
-  Protecting aquatic and associated ecosystems their biological diversity;
-  Reducing and preventing pollution and degradation of water resources;
-  Meeting international obligations;
-  Promoting dam safety; and
-  Managing floods and drought.

Section 21 of the NWA sets out water uses that may require registration or licencing. In terms of the NWA, water uses include any activity involving the following:

- a) Taking water from a water resource.
- b) Storing water.
- c) Impeding or diverting the flow of water in a watercourse.
- d) Engaging in a stream flow reduction activity contemplated in section 36.
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1).
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- g) Disposing of waste in a manner which may detrimentally impact on a water resource.
- h) Disposing in any manner of water which contains waste from or which has been heated in, any industrial or power generation process.
- i) Altering the bed, banks, course or characteristics of a watercourse.

- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- k) Using water for recreational purposes.






**Relevance to the proposed development:**

The proposed sub-transmission line does trigger licensing in terms of this Act, only during the construction phase. A Section 21 (c) and (i) water use licence was obtained for crossing over a watercourse (refer to **Appendix N**).

**3.6. The White Paper on Integrated Pollution and Waste Management for South Africa:**

Integrated pollution and waste management is a holistic and integrated system and process of management aimed at pollution prevention and minimisation of source, managing the impact of pollution and waste of the receiving environment and remediation damaged environments.







The White Paper on Integrated Pollution and Waste management for South Africa represent a paradigm shift from dealing with waste only after it is generated (i.e., "end of pipe towards):

-  Pollution prevention;
-  Waste minimisation;
-  Cross media integration;
-  Institution integrated both horizontal and vertical, of department and spheres of government; and
-  Involvement of all sectors of society in pollution and waste management.

The government believes that pollution prevention is one of the most effective means of protecting South Africa people and environment. Pollution prevention eliminates costly and unnecessary waste and promotes sustainable development. It aims to reduce risks to human health and environment by trying to eliminate the causes rather than treating the symptoms of pollution.

This Integrated Pollution and Waste Management for South Africa apply to all government institutions, society at large and to all activities that impact on pollution and waste management. One of the fundamental approaches of this policy is to prevent pollution, minimise waste and to control and remediate impacts. The management of waste will be implemented in a holistic and integrated manner, and will extend over the entire waste cycle, from "cradle to grave" including the generation, storage, collection, transportation, treatment, and final disposal of waste.

The government aims to:





-  Encourage the prevention and minimisation of waste generation and thus pollution at source;
-  Encourage the management and minimization of the impact of unavoidable waste from its generation to its final disposal;
-  Ensure the integrity and sustained “fitness for use” of all environmental media, i.e., air, water, and land;
-  Ensure that any pollution of the environment is remediated by holding the responsible parties accountable;
-  Ensure environmental justice by integrating environmental considerations with the social, political and development needs and rights of all sectors, communities, and individuals; and
-  Prosecute non-compliance with authorizations and legislation.

### **3.7. Environmental Conservation Act, (Act No .73 of 1989):**

In terms of section 20 (1) of the Environmental Conservation Act, 1989, (Act 73 of 1989), waste can only be disposed of at a facility that has a permit issued by the Minister of Water Affairs and Forestry. The facility must be sited, designed, operated, and monitored strictly in accordance with the permit conditions. These conditions will include the requirements, standards and procedures set out in the DWS waste management series.

It should be noted that section 20 (1) of the Environmental Conservation Act, 1989 has been amended in terms of the issuing of waste disposal permits and exemptions is now the responsibility of the minister of Environmental Affairs.









Section 24 of the Act allows the Minister to make regulation with respect to several waste management issues and include the following regulations:

-  Disposal site application;
-  Directions for control and management of general and small waste disposal sites;
-  Noise control regulations; and plastic bag Regulations; and
-  The waste will thus be subject to a permit issued under section 20 of the ECA.

### **3.8. Occupational Health and Safety Act, 1993 (Act No. 85 of 1993):**






The Occupational Health and Safety Act 85 of 1993 is South Africa's principal legislation concerning health and safety of employees. It also aims to protect persons who are not at work against hazard to health and safety arising out of or in connection with the activities of persons at work. The Act places the responsibility on the employer to ensure a safe and healthy working environment and to cause every employee to be made conversant with health and safety requirements relevant to their work. At the same time the Act places the responsibility on the employee to follow its employer's health and safety procedures and instructions.

Several Regulations have been promulgated under the Act that is relevant to development including the following:

-  General Administrative Regulations, 1994;
-  Asbestos Regulations, 2001;
-  Lead Regulations, 2003;
-  Regulations for Hazardous Chemical Substances, 1995;
-  Hazardous Biological Agents of 2001;
-  General Safety Regulations, 1986;
-  Environmental regulations for workplaces (Department of Labour, 1994); and
-  Construction Regulations, 2003.

#### **Relevance to the proposed development:**

All waste management activities need to be carried out in accordance with the requirements of the OHS Act and must include the following activities:

-  Waste Management Practices must be safe and without risk;
-  Risk Assessments conducted should include waste related activities;
-  Waste management training should be provided to employees and contractors;
-  Written work instructions should be provided where necessary; and
-  Relevant personal protective equipment and respiratory protective equipment must be provided as last resort after all mitigatory measures have been reviewed.

### **3.9. The National Heritage Resources Act (Act 25 of 1999):**

The National Heritage Resources Act (Act 25 of 1999) (NHRA) introduces an integrated and interactive system for managing national heritage resources. The NHRA also includes landscapes and natural features of cultural significance as heritage resources.

Section 38 of the NHRA indicates that *"any person who intends to undertake a development categorised as-*

- a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*
- b) the construction of a bridge or similar structure exceeding 50 m in length;*
- c) any development or other activity which will change the character of the site –
  - i). exceeding 5000 m<sup>2</sup> in extent, or*
  - ii). involving three or more erven or subdivisions thereof; or*
  - iii). involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
  - iv). the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;**
- d) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;*
- e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."*

#### **Relevance to the proposed development:**

The proposed 132kV sub-transmission line is a linear development that does not exceed 5000m<sup>2</sup>, refer to the project description and won't alter the character of the landscape. A Phase 1 Heritage Impact Assessment (HIA) was conducted in accordance with the NHA (Act 25 of 1999). Refer to **Appendix H** for the HIA specialist report.



### **3.10. The National Forest Act (Act No. 84 of 1998):**

The National Forests Act (NFA) was passed to protect and conserve trees growing in South Africa. The purpose of the NFA is to preserve trees and forests and to promote the sustainable management and development of forests for the benefit of all South Africans. Government Gazette 46094 (Notice No. 1935), published on 25 March 2022, lists nationally protected trees, which under the Act are protected against specific activities. The effect of declaration is that no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette.







#### **Relevance to the proposed development:**

Protected trees identified on-site may not be cut, disturbed, damaged, or destroyed without a relevant permit. If no permit is obtained, the proponent is responsible to ensure that the powerline layout is adapted as to remain compliant to the NFA (Act No. 84 of 1998).

### **3.11. The Northern Cape Nature Conservation Act (Act No. 9 of 2009):**

The Northern Cape Nature Conservation Act (Act No. 9 of 2009) as amended on January 2012, aims to provide for the sustainable utilisation of wild animals, aquatic biota and plants; to provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; to provide for offences and penalties for contravention of the Act; to provide for the appointment of nature conservators to implement the provisions of the Act; to provide for the issuing of permits and other authorisations; and to provide for matters connected therewith.

The NCNC (Act No 9 of 2009) further identifies six schedules of biota, which enables the provisions stipulated in the act:

-  Schedule 1 - Specially Protected species;
-  Schedule 2 - Protected species;
-  Schedule 3 - Common indigenous species;
-  Schedule 4 - Damage causing animal species;
-  Schedule 5 - Pet species; and
-  Schedule 6 - Invasive Species.

Regarding protected flora and fauna, the NCNC (Act No 9 of 2009) also provides a detailed list of plants and animals classified within each schedule.

#### **Relevance to the proposed development:**

Provincially protected fauna and flora as indicated by the NCNC (Act No 9 of 2009) should be managed according to the legislative stipulations outlined in the act. The occurrences of such species will be assessed and discussed in the ecological reports contained within this document.

**3.12. National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended:**

The National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998, as amended) provides for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state, and to provide for matters connected therewith.

Integrated Environmental Management (IEM) is a philosophy, which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development. In terms of the 2014 Basic Assessment (BA) Regulations of the National Environment Management Act, 1998 (Act No. 107 of 1998, as amended) published 4 December 2014 (and updated on 7 April 2017), a Basic Assessment Report (BAR) is required for activities listed in Notices R327 and R324, and an Environmental Impact Assessment is required for activities listed in Notice R325.

*Table 7: The triggered Listing Notices*

<b>Listed activity nr.</b>	Listed activity description	Relevance to the project
<b>Listing Notice 1 (GN R 327, 07 April 2017)</b>		
Activity 11	The development of facilities or infrastructure for the transmission and distribution of electricity—  (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	The proposed powerline will entail the construction of a 132 kV sub-transmission line outside the urban edge for the transmission and distribution of electricity.
Activity 12	The development of - dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or 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.	The pylon footprints and 132kV sub-transmission line (i.e. cabling) will exceed 100 m <sup>2</sup> and will be constructed within a watercourse and / or within 32 m of a watercourse located within the project site.

Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse	The pylon footprints and 132 kV sub-transmission line will require the infilling or depositing of material of more than 10 m <sup>3</sup> or the excavation, removal or moving of soil, sand, pebbles or rock of more than 10 m <sup>3</sup> from a watercourse.
<b>Listing Notice 3 (GN R324, 07 April 2017)</b>		
Activity 12 (b) (ii)	The clearance of an area of 300 square metres or more of indigenous vegetation Within critical biodiversity areas identified in bioregional plans.	The construction of the 132 kV transmission line entails the clearance of more than 300 m <sup>2</sup> of vegetation, within a Critical Biodiversity Area 1 (CBA21) ( <b>figure 3 / Appendix A</b> ).

### **3.13. . Renewable Energy Development Zones (REDZs)**

Renewable Energy Development Zones (REDZ) play a key role in South Africa's Just Energy Transition, creating priority areas for investment in the electricity grid and increasing South Africa's green energy map, by enabling higher levels of renewable power penetration. REDZ are known as geographical areas where wind and solar PV development may occur within concentrated zones, in turn creating priority areas for investment in the electricity grid. Therefore, an increase in South Africa's green energy map can be expected by enabling higher levels of renewable power generation.

On 16 February 2018, the Minister published Government Notice No. 114 in Government Gazette No. 41445, which identified eight (8) renewable energy development zones essential for developing large-scale wind and solar photovoltaic facilities. The Government Notice included the procedure to be followed when applying for environmental authorisation for large-scale wind and solar photovoltaic energy facilities in these REDZs.

On 26 February 2021, the Minister published Government Notices No. 142, 144 and 145 in Government Gazette No. 44191, which identified three (3) additional REDZs for implementation as well as the procedures to be followed when applying for environmental authorisation for electricity transmission or distribution infrastructure or large-scale wind and solar photovoltaic energy facilities in these REDZs.

According to the REDz regulations, any large-scale renewable wind or solar PV energy facilities situated entirely within these designated areas should follow the Basic Assessment Report environmental authorisation process. Additionally, any associated infrastructure deemed necessary for the realisation of renewable developments in these designated areas is subject to the same REDz regulations.

**Relevance to the proposed development:**

The proposed 132 kV transmission line development is considered a crucial development component for the realisation of the Orange River Solar Facility 1. Considering the Orange River Solar Facility's placement entirely within a REDz, both the solar facility and its associated infrastructure required for the realisation of that project are subject to the REDz regulations. **Refer to Appendix A and H** for visual reference of the powerline and solar farm's relationship to the mentioned strategic environmental authorisation areas.

## 4. Public participation process

According to Section 19, of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include “(1) *Where basic assessment must be applied to an application, the applicant must, within 90 days of receipt of the application by the competent authority, submit to the competent authority—*

- a. *basic assessment report, inclusive of specialist reports, an EMPr and where applicable a closure plan, which have been **subjected to a public participation** process of at least **30 days** and which reflects the incorporation of comments received, including any comments of the competent authority; or*
- b. *a notification in writing that the basic assessment report, inclusive of specialist reports, an EMPr ; ( and where applicable, a closure plan, will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the basic assessment report or EMPr or, where applicable, a closure plan, which changes or information was not contained in the reports or plans consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised reports or ;( EMPr or, where applicable, a closure plan will be subjected to **another public participation process** of at least **30 days**.*






Refer to **Appendix E** for the full participation report.

### Objectives of the public participation process:

Public Participation Process (PPP) forms an integral part of the application process. It provides people with the opportunity to raise their issues and concerns about the proposed Groblershoop 132 kV sub-transmission line. The public participation process to which this BA process is subjected to must “*give all potential or registered interested and affected parties, including the competent authority, a period of at least 30 days to submit comments.*” In addition, the public participation process “*must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application.*” Public participation must include “*consultation with—*




- a) *the competent authority.*
- b) *every State department that administers a law relating to a matter affecting the environment relevant to an application for an environmental authorisation.*
- c) *all organs of state which have jurisdiction in respect of the activity to which the application relates; and*
- d) *all potential stakeholders, landowners, land users, where relevant, registered interested and affected parties.”*

In terms of the NEMA, public participation process provides people who may be affected by the proposed development with an opportunity to provide comment and to raise issues of concern about the project, or to make suggestions that may result in enhanced benefits for the project. Comments and issues raised during the PPP will be captured, evaluated, and included in a comments and responses register. Note that this is an ongoing process. The issues will be addressed and included in the final version of the report, submitted to Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR).

<b>Pre-Application</b>	Decision of scope of work	
	Stakeholders identification and analysis	
	Stakeholders engagement planning	
	Inclusion of the stakeholders engagement process into application forms	
<b>Submission of BA report to competent authorities</b>		
<b>Basic Assessment</b>	Undertake	30 Day for public comment to
	Availability of Basic Assessment reports and Management plan (BA/EMPr) for public comment	
	 Notification to stakeholders	
	 Adverts	
	 Site notices available in public places	
	 BA/EMPr available in public places	
	 Meetings and telephone consultations	
Update comments and response report		
Update BA/EMPr		
<b>Decision Phase</b>	Inform the stakeholders on record of decision and appeals process	57 days ( <i>REDz regulations</i> )
	Notification to stakeholders, and place on website	
<b>Appeals</b>	Notification of appeal(s)	20 days
	Undertake mediation process	
	Notification of result of appeal	

### **Pre application public participation:**

The involvement of Interest and Affected Parties is vital in environmental assessment projects. The announcement of the BA process and consequently the invitation of Interested and/or Affected Parties (I&APs) to participate was facilitated by the following methods:

-  Site notice boards;
-  Newspaper advertisements; and
-  The distribution of the Background Information Document (BID).

### **Identification of stakeholders:**

During the inception phase of the project, I&APs and other key stakeholders were identified for the proposed development. This included identification of landowners, land occupants, farm, associations, ward councillors and relevant governmental officials. Engagements with I&APs and other stakeholders is an ongoing process and will continue into the BAR process.

### **Notification of the BA process:**

The public participation process was initiated with the placement of site notices and the distribution of the BID to pre-identified I&APs and stakeholders.

### **Site notices:**

Notice boards was placed where it is accessible by the public, at the site and surrounding boundary. The site notice boards illustrated key details pertaining to the development. Steps for potential I&APs to register and contact EMG was clearly illustrated on the site notices.

### **Distribution of background information documents:**

The purpose of the BID is to ensure all relevant information and process be being followed are made available to a wide range of stakeholders. Registered I&AP are also furnished with the BID.

### **Advert:**

The EIA guideline document stipulates that notices informing the public of the proposed development be placed on site and the project should be advertised in a local newspaper. All stakeholders and I&APs were notified of the availability of the draft reports via newspaper adverts. The published advert illustrated key information

pertaining to the development and the steps for potential I&APs to lodge any comments they might have.

**Public participation information included in the BA report:**

The Public Participation Process requires that the following information be included as part of the Public Participation Section of the BA report:

- (i). The steps undertaken in accordance with the Plan of Study For BA,
- (ii). A list of persons, organisations and government organs that were registered as interested and affected parties.
- (iii). A summary of comments received from, and a summary of issues raised by the interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments.
- (iv). Copies of any representations, objections and comments received from the registered interested and affected parties.

Mitigation measures and guidelines listed in the BA report are summarised in a user-friendly document named the Environmental Management Plan (EMP). The compilation of an EMP is a requirement of the BA Process (Section 19 and 20 of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998).

**Public participation summary:**

The public participation process for the proposed development commenced on 16<sup>th</sup> August 2022 and is currently ongoing. The table below presents a summary of steps already taken regarding the PPP.

*Table 8: The project schedule and associated dates*

<b>Phase</b>	<b>Requirement</b>	<b>Date</b>
<b>Inception Phase</b>	Site notice	16 <sup>th</sup> of August 2022
<b>BAR compilation and public involvement</b>	Newspaper Advert	4 <sup>th</sup> of November 2022
	Letters of notification	October 2022
<b>BAR distribution for 30-day public commenting period</b>	BAR circulated to all registered I&APs including CA	This will be conducted following the submission of this report.



## 5. Project motivation

According to Appendix 1, Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include “(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.”

### **The need for the proposed development:**

The proposed powerline will provide transmission of power from the Orange River Facility’s substation to Eskom’s substation (high voltage) and will be addressing South Africa’s current energy crisis. The project also falls within the Provincial Spatial Development Framework (PSDF) as the Northern Cape Provincial Growth and Development Strategy (2011) identifies the following sectors as areas of potential growth: (1) Agriculture and Agro-processing; (2) Fishing and Marine-culture; (3) Mining and Mineral Processing; (4) Manufacturing; (5) Tourism; (6) Knowledge Economy; and (7) **Energy**.

Currently, South Africa is experiencing an energy crisis with continuous pressure that is placed on the national electricity grid. As a result, solar farms are being developed to alleviate the pressure that is placed on the grid. Solar power is a form of “clean green energy” that forms a positive contribution to sustainable development in the country. The construction of powerlines is crucial to establish a connection between solar facilities and substations, which in turn supplies energy to the national grid.

In addition, the project will greatly contribute to employment creation especially to the disadvantaged individuals.

### **Desirability in the context of relevant policy:**

The need and desirability of any given project is an essential element of the BA process. The guidelines on need and desirability published by the DFFE (formerly known as DEA) in GN R891 (October 2014) indicated that while addressing the growth of the national economy through the implementation of various national policies and strategies, it remains crucial that these policies should take cognisance of strategic concerns such as climate change, food security, and the status of South Africa's ecosystem services. The DFFE guideline further emphasises that at the project level, the need and desirability of development should consider the content of regional and local plans, frameworks, and strategies.

Table 9: Need; desirability and benefits of the proposed powerline site.

<b>NEED:</b>			
1.	Was the relevant provincial planning department involved in the application?	YES	NO
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES	NO
<b>DESIRABILITY:</b>			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	NO
4.	Will the proposed land use / development impact on the sense of place?	YES	NO
5.	Will the proposed land use / development set a precedent?	YES	NO
6.	Will any person's rights be affected by the proposed land use / development?	YES	NO
7.	Will the proposed land use / development compromise the "urban edge"?	YES	NO
<b>BENEFITS:</b>			
1.	Will the land use / development have any benefits for society in general?	YES	NO
2.	Explain: Investors will notice the many solar development projects within the area and therefore consider investing in similar developments within the same area, which in turn will boost the regional economy, and create job opportunities.		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO
4.	Explain: The proposed powerline will also create a vast number of employment opportunities to the local community during the construction phase of development, especially the disadvantaged individuals. The community of Groblershoop has experienced a legacy of poverty, high unemployment, insufficient access to resources and less loadshedding as a result, thus providing benefits to local businesses.		

## 6. Alternatives

According to Appendix 1, Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include:

*“(g) a motivation for the preferred site, activity and technology alternative;*

*(h) a full description of the process followed to reach the proposed preferred alternative within the site, including:*

*(i) details of the development footprint alternatives considered;*

*(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;*

*(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and*

*(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.”*

The 2014 NEMA EIA Regulations (as amended in 2017) defines alternatives as *“different means of meeting the general purpose and requirements of the activity, which may include alternatives to the—*

*(a) property on which or location where the activity is proposed to be undertaken;*

*(b) type of activity to be undertaken;*

*(c) design or layout of the activity;*

*(d) technology to be used in the activity; or*

*(e) operational aspects of the activity;*

*and includes the option of not implementing the activity, “No-go”.*

The alternatives considered for this application are discussed below. These alternatives were evaluated on their developmental constraints, socio-economic and environmental impacts. This evaluation process was utilised to support the preferred alternative presented in this document ultimately. It is, however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognises that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal.

### **Site locality alternative:**








In terms of the NEMA EIA Regulations, the applicant is required to demonstrate that feasible and reasonable alternatives have been investigated in sufficient detail for environmental authorization.

The powerline's linear nature limits layout alternatives and as such layout alternatives are discussed along with locality alternatives. The development of a linear development's costs and feasibility depend on the distance of the development and the owners of the property on which the development falls. All these factors have been considered and the applicant prefers to keep the development on his own property to reduce the costs associated with such development and to reduce the total disturbance of the natural environment.





No alternative site has been considered for purposes of the powerline as this land is available and already belongs to the applicant and suits the desired purpose, the development footprint also follows the shortest route possible with the least disturbance to the natural environment. According to the Provincial Spatial Development Framework, this site is within an area which is designated for the construction of solar power facilities, which includes the construction of the powerline and associated infrastructure, the best suitable option in terms of environmental sensitive features, i.e. aquatic biodiversity and terrestrial biodiversity, is the allocated area as illustrated on **Figure 2** and is therefore deemed to be the best suitable option.

### **No go alternative:**

The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed development. This alternative would result in no environmental impacts on the site or surrounding local area. It provides the baseline against which other alternatives were compared. The following implications will occur if the "no go" alternative is implemented:

-  If not authorised, the electricity generated from the ORSF1 will not be able to reach the national grid.
-  No benefits will be derived from the implementation of an additional land-use.
-  This will further enforce more strain on the already outdated electrical grid.
-  Considering the national grid is largely supplied by non-renewable energy production facilities (90% coal based), the no go option will indirectly result in more carbon dioxide emissions.
-  The authorisation refusal of this powerline will indirectly create a precedence which will deter future renewable energy developments in the area.
-  Socio-economic benefits such as job creation, skills development, and local economic growth will be lost.
-  Local economic benefits will not be realised.

Besides the above mentioned, the following benefits might occur if the no go alternative is implemented:

-  No vegetation will be removed and or disturbed.
-  The ecology will remain largely intact.
-  No change/ alteration to the existing landscape.
-  No additional waste will end up in landfill sites.

## 7. The *in-situ* environment

### Physical characteristics

#### 7.1.1. Climatic profile

Table 10: The climatic profile information of the *in-situ* environment

During the summer months, November to March, the average high temperature peaks at 32°C. January is considered to be the hottest month of the year ranging between 21°C - 35°C.

During the winter months, May to August, the average high temperature peaks at 23°C. July is considered to be the coldest month of the year ranging between 4°C to 21°C. (Weatherspark.com).

Temperature

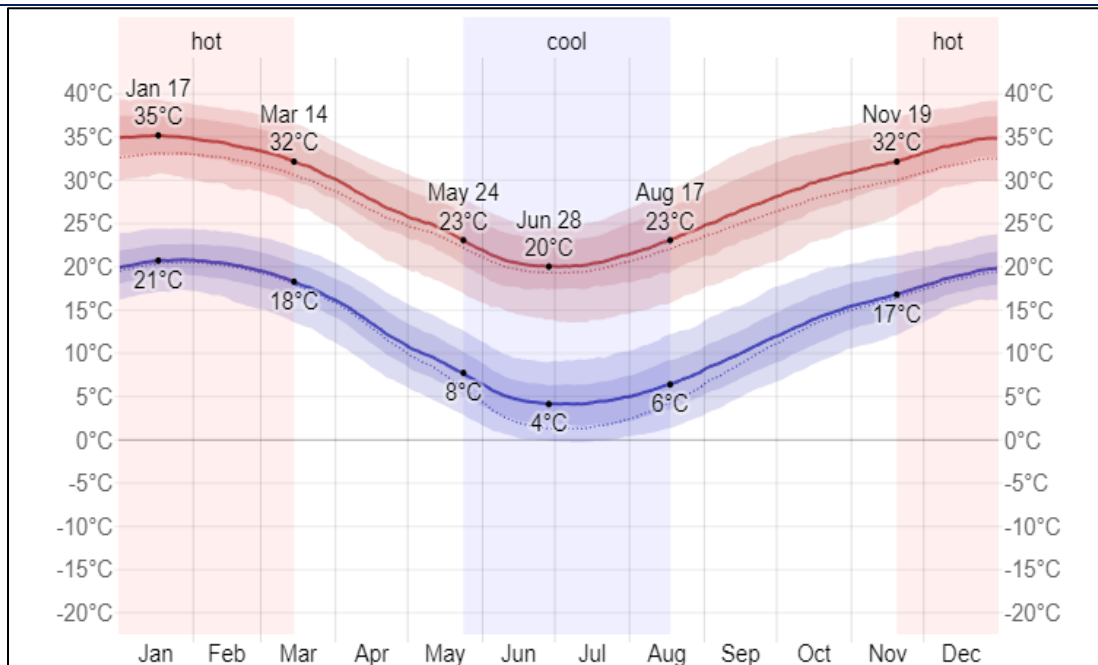


Figure 6: Average temperature in Groblershoop during the year (Source: <https://weatherspark.com/y/86570/Average-Weather-in-Groblershoop-South-Africa-Year-Round>).

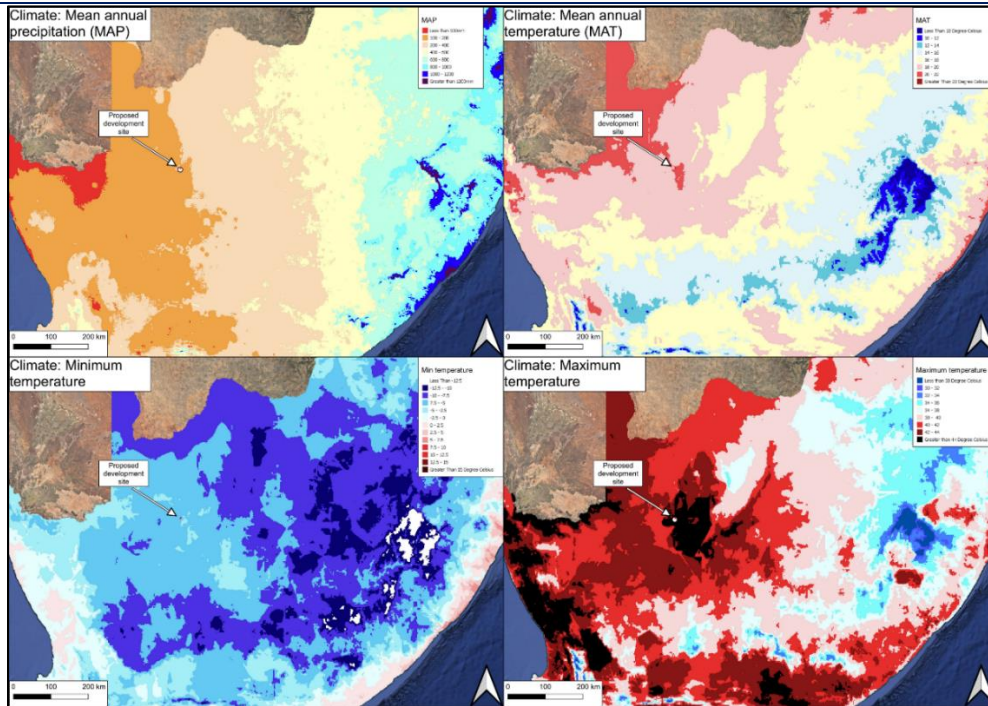


Figure 7: Various maps depicting climate specific information. (top left) Mean annual precipitation, (top right) Mean annual temperature, (bottom left) Extreme minimum temperature, (bottom right) Extreme maximum temperature.

The rainy season lasts approximately 5 months from November to April, with a greater than 9% chance of rain on any given day. February is considered to be the wettest month of the year with an average of 4.7 days of precipitation.

The dry season lasts approximately 7 months from April to November. July is considered to be the driest month of the year with the least amount of rain measured (Weatherspark.com).

**Precipitation**

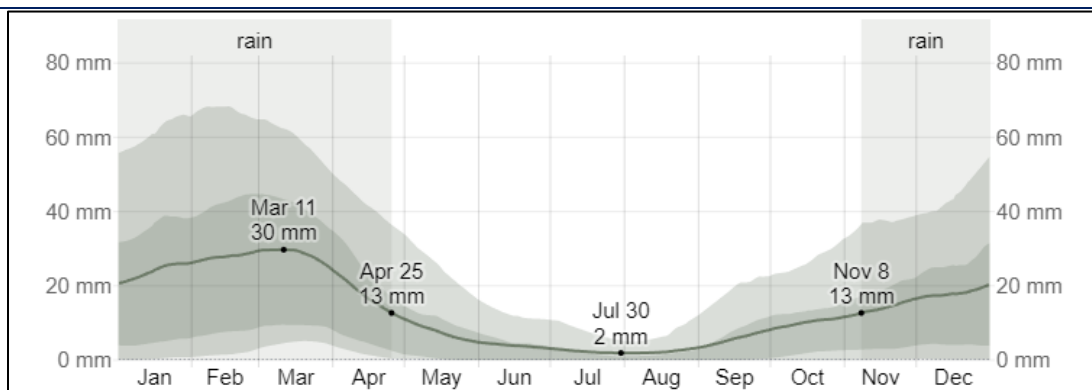


Figure 8: Average rainfall of Groblershoop during the year (Source: <https://weatherspark.com/y/86570/Average-Weather-in-Groblershoop-South-Africa-Year-Round>).

**Wind**

The average hourly wind speed in Groblershoop experiences mild seasonal variation over the course of the year.

During the windier months of the year, June to January, the average wind speeds are more than 15 kph. October is considered to be the windiest month of the year averaging at 16.5 kph.

January to June is the calmer and during March the average hourly wind speed is at 13.3 kph.

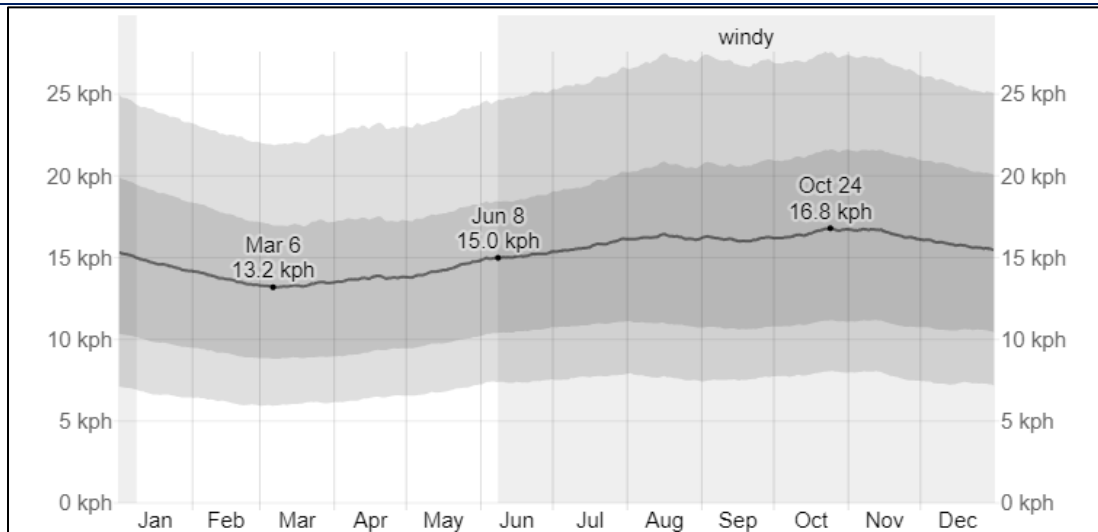


Figure 9: Average wind for Groblershoop during the year (Source: <https://weatherspark.com/y/86570/Average-Weather-in-Groblershoop-South-Africa-Year-Round>).

### 7.1.1. Topography and landscape features:

The assessment area falls within the Lower Orange Water Management Area (WMA 14) and the associated D73D quaternary surface water catchment- and drainage area. The Orange River flows through the assessment area and continues in a north-westerly direction. Due to the undulating terrain created by the underlying geology, numerous high ridges and low valleys are formed. Several small but still significant drainage lines emerge via topographical funnelling, which promotes surface drainage. These ephemeral watercourses will possibly be affected by the proposed development and are discussed in detail in both the impact assessment and the aquatic ecological report.



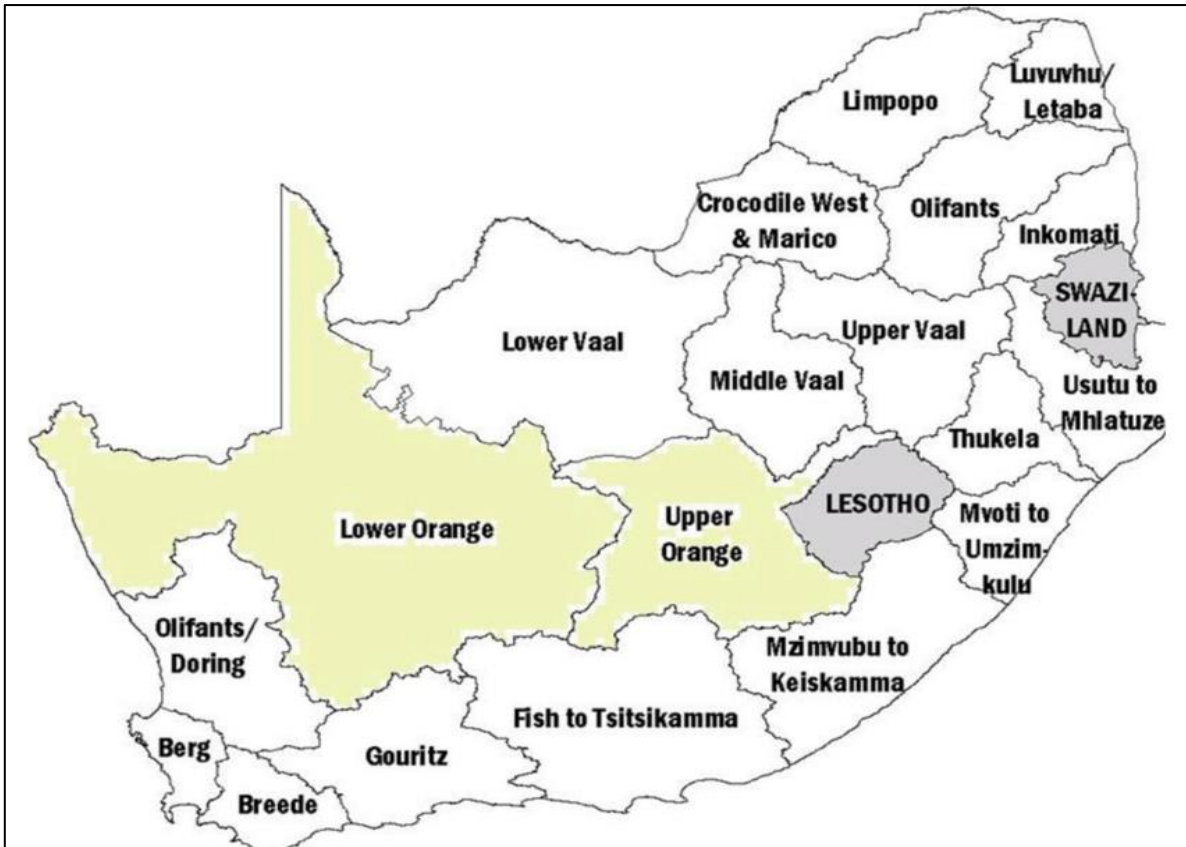


Figure 10: Map of South Africa showing the 19 water management areas (WMAs) (Munnik et al., 2016).

### 7.1.2. Geology

According to the 1:250 000 geological map 2822 Postmasburg, the study area is underlain by metavolcanic-metasedimentary bedrock of the Groblershoop Formation (Brulpan Group, Namaqua–Natal Province) with geologically recent alluvial overbank sediments flanking the current flow of the Orange River. The proposed development is located on high relief terrain where metavolcanic-metasedimentary rocks are capped by a thin veneer of bedrock–derived, gritty to gravelly top soils on the high ground, with surface limestones and sheetwash / alluvium predominating low-lying drainage lines.

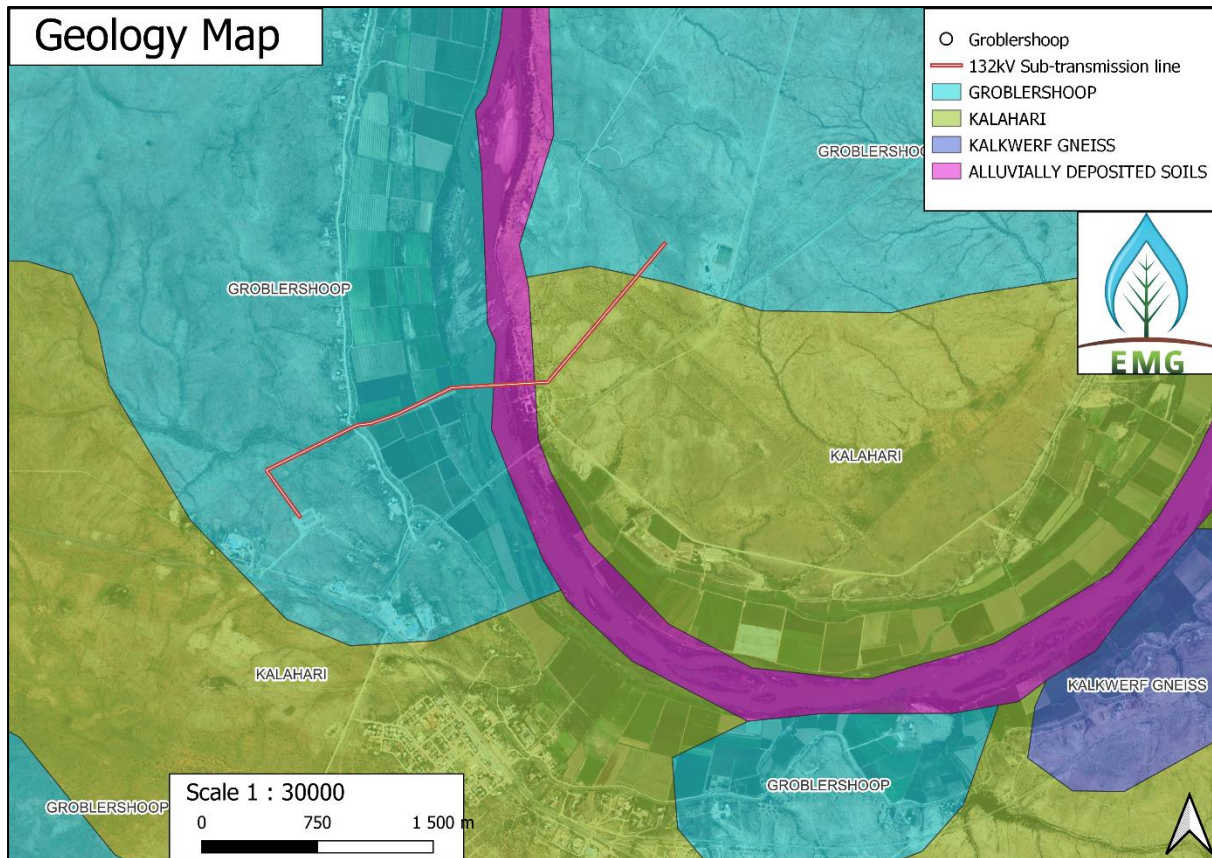


Figure 11: Map indicating the geological features of the proposed powerline development area. Purple marked area on map represents the recently alluvial deposited soils associated with the Orange River.

## Biological characteristics:

### 7.1.3. Ecological:

#### 7.1.3.1. Regional vegetation:

The proposed development area is located within the Nama Karoo biome and Alluvial vegetation of the Succulent Karoo.

At the Biome scale, the Nama-Karoo biome is dominated by dwarf shrubs, grasses, succulents, geophytes, and annual forbs, with small trees only occurring along drainage lines. The Nama-Karoo biome covers 19.6% of southern Africa. Three bioregions distinguish the vegetation of the Nama-Karoo. These are the (1). Bushmanland and West Griqualand, (2) Upper Karoo and (3). Lower Karoo bioregions. Bushmanland Arid Grassland is described under the Bushmanland and West Griqualand bioregion (Mucina and Rutherford, 2006). Average annual precipitation for the NKb3 is 133 mm, with the majority of rainfall occurring in late summer-autumn (January to May). Rainfall is variable from year to year.

Alluvial vegetation is vastly diverse across the biomes of South Africa, but common floristic and ecological features unite the vegetation type. In the Succulent Karoo biome, alluvial vegetation consists of plant species that are capable of surviving or even thriving in waterlogged, nutrient-rich soils which experience occasional disturbance. This vegetation type is susceptible to change as habitat disturbance allows for the rapid spread of indigenous species as well as alien and invasive species (Mucina and Rutherford, 2006).

This bioregion is dominated by arid grasslands and shrublands. A slightly sloping plateau with extensive, sometimes undulating, plains is a characteristic landscape feature of the NKb3 vegetation type. NKb3's sparse vegetation is dominated by *Stipagrostis* species. Other dominant graminoids include *Aristida adscensionis*, *A. congesta*, *Enneapogon desvauxii*, *Eragrostis nindensis*, *Schmidtia kalahariensis* and *Cenchrus ciliaris*. The dwarf shrub layer is dominated by *Aptosimum spinescens*, *Hermannia spinosa* and *Pentzia spinescens*. Dominant medium/ tall shrubs include *Lycium cinereum*, *Rhigozum trichotomum* and *Cadaba aphylla*. NKb3 vegetation type has a conservation status of least concern (LC). The protected area extent covers 191.7819km<sup>2</sup>, a mere 0.5% of the original vegetation-type area (Skowno et al., 2018).

Flat alluvial terraces, riverine islands and flooded grasslands are characteristic landscape features of the Aza3 vegetation type (Mucina and Rutherford, 2006). Riparian thickets dominated by *Euclea pseudebenus*, *Tamarix usneoides* and *Ziziphus mucronata* and reed beds with *Phragmites australis* are typical of Aza3 (Mucina and Rutherford, 2006). AZa3 vegetation type has a conservation status of least concern. AZa3 is poorly protected, with a protected area extent covering 66.0411 km<sup>2</sup>, which is 7.6% of the original vegetation type area (Skowno et al., 2018).

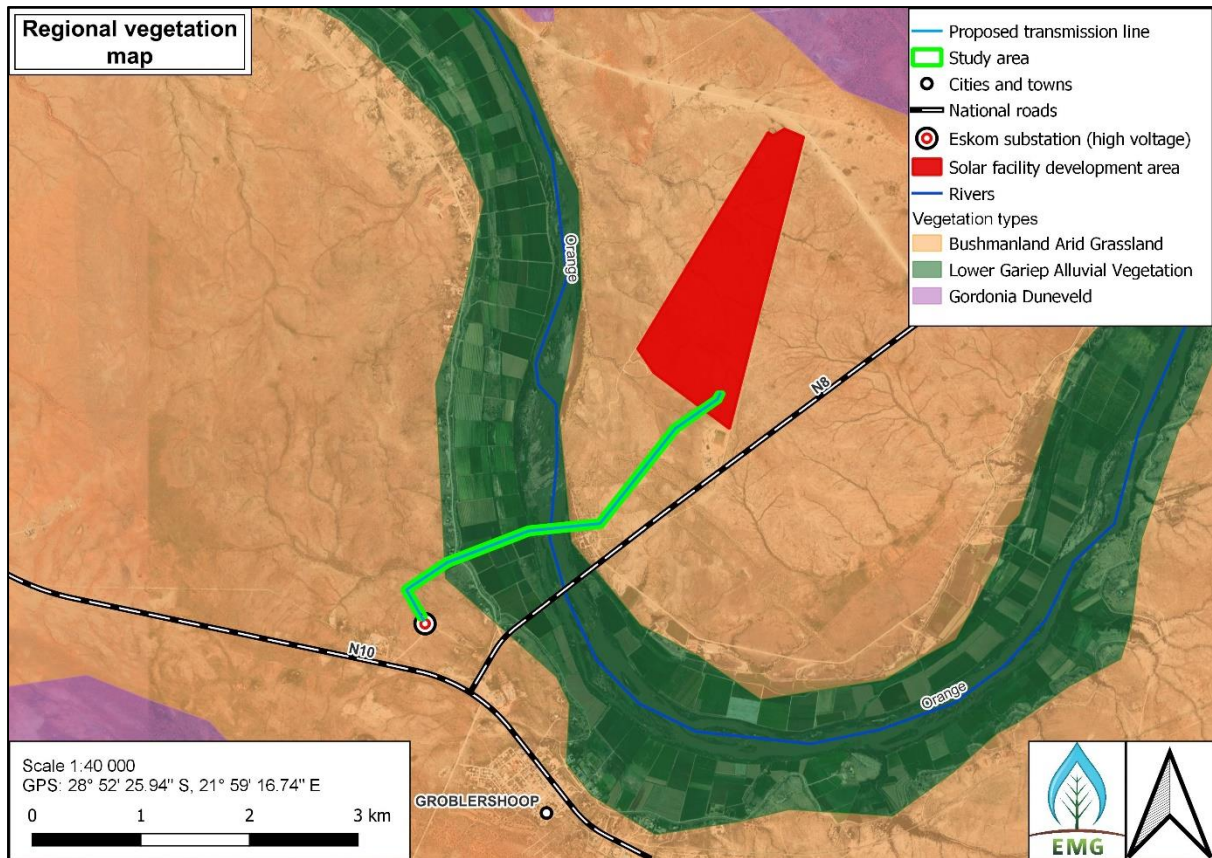


Figure 12: Regional vegetation indicating the site's locality within the Bushmanland Arid Grassland (NKb 3) and Lower Gariep Alluvial Vegetation (AZa3) (SANBI, 2006-2018).

### 7.1.3.2. On site vegetation:

Nine homogeneous vegetation units were identified within the study area. The vegetation unit delimitation was based on floral homogeneity, vegetation composition distinctiveness and influences of anthropogenic disturbances. Broadly, the study area's vegetation resembles that of an open Nama-Karoo dwarf shrubland with semi-open to closed riparian vegetation.

The proposed transmission line development area is located within critical biodiversity areas one and two.

Critical biodiversity areas are pristine to near pristine natural areas that must remain in good ecological condition. CBA 1 areas are considered to be irreplaceable, while CBA 2 areas are considered optimal or best-design sites. These areas require a conservative approach to land use changes (SANBI, 2017).

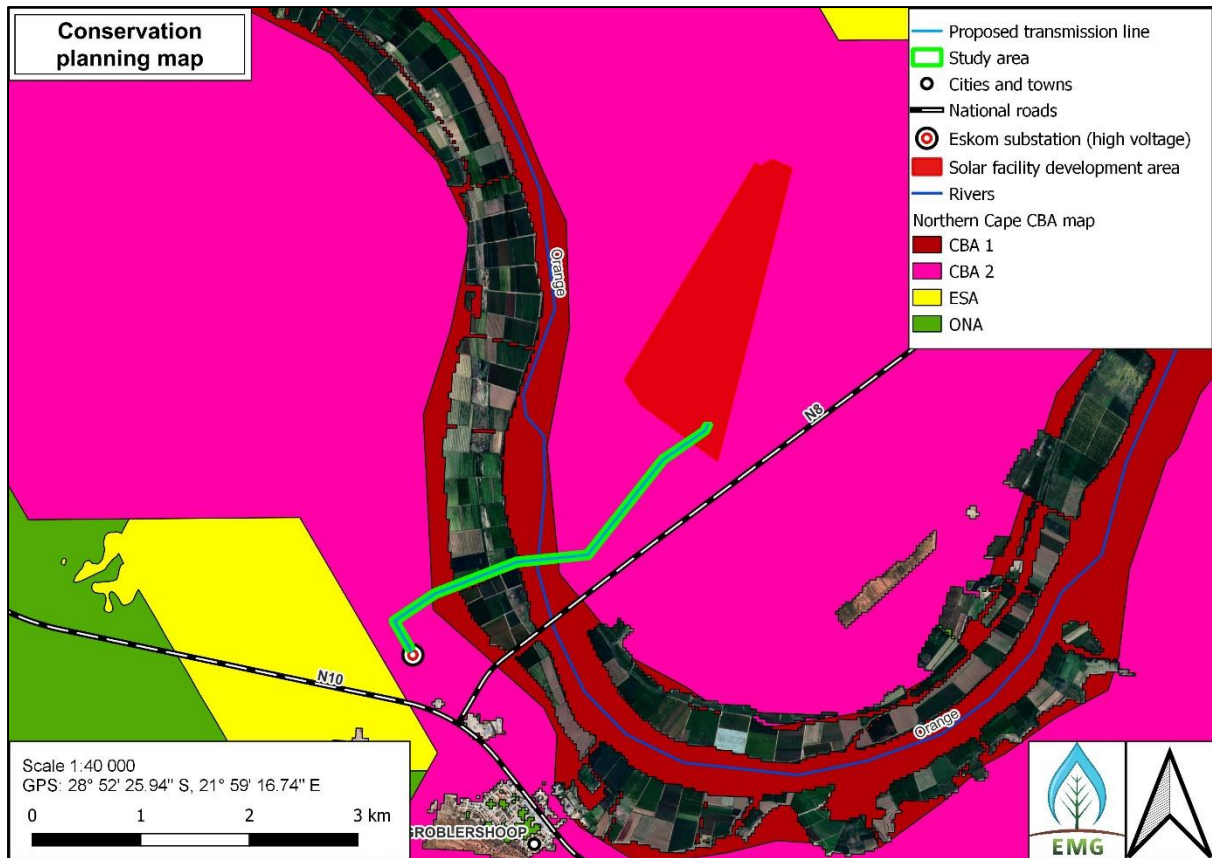


Figure 13: The study area is majorly found in a CBA 2 area but also crosses over a CBA 1 area according to the Northern Cape spatial biodiversity plan (SANBI, 2017).

### 7.1.3.3. Protected species:

The list of protected flora species and their status is described below (Table 11).

Table 11: Protected plant species located within the proposed powerline site, Groblershoop.

Family	Species	Red list status	Protection level
<b>Capparaceae</b>	<i>Boscia albitrunca</i>	LC	NCNCA (2009), Schedule 2 NFA (1998)
<b>Fabaceae</b>	<i>Vachellia erioloba</i>	LC	NFA (1998);
<b>Aloaceae</b>	<i>Aloe claviflora</i>	LC	NCNCA (2009), Schedule 2
<b>Aloaceae</b>	<i>Aloe hereroensis</i>	LC	NCNCA (2009), Schedule 2
<b>Asphodelaceae.</b>	<i>Haworthiopsis tessellata</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia braunsii</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia gariepina</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia gregaria</i>	LC	NCNCA (2009), Schedule 2
<b>Euphorbiaceae</b>	<i>Euphorbia spinea</i>	LC	NCNCA (2009), Schedule 2
<b>Iridaceae</b>	<i>Gladiolus permeabilis</i>	LC	NCNCA (2009), Schedule 2
<b>Meliaceae</b>	<i>Nymannia capensis</i>	LC	NCNCA (2009), Schedule 2
<b>Fabaceae</b>	<i>Lessertia cf. pauciflora.</i>	LC	NCNCA (2009), Schedule 1

## Socio-economic characteristics:

### 7.1.4. Locality and setting:

The proposed sub-transmission line development is situated within Groblershoop, which falls under the !Kheis Local Municipality. The !Kheis Municipality is considered to be a Category B Municipality and falls under the ZF District Municipality.

### 7.1.5. Municipal population statistics:

The !Kheis Local Municipality's IDP ('21-'22) states that the population increased by 1 520 people, from 15 064 people in 1996 to 16 566 people in 2016. The population groups represent various percentages within the Municipality, where the Coloured population group represents 89.8% of the total population in the municipality, followed by the White population group at 5.3%, then the Black African and Indian/Asian population groups each having a share of 4.5% and 0.5% respectively (!Kheis IDP '21-'22). There was an increase in Coloured and Black African population groups with an increase of 1 690 people within the Coloured population group and an increase of 314 people within the Black African population group. The biggest decrease was observed in the White population group which decreased by 409 persons (1 279 people in 1996 to 870 people in 2016).

Table 12: Population by group type between 1996 – 2016

NC084: !Kheis	1996	2001	2011	2016
Black African	423	745	1 144	737
Coloured	13 189	14 198	14 200	14 879
Indian or Asian	-	6	167	79
White	1 279	1 590	901	870
Other	-	-	226	-
Unspecified	155	-	-	-
<b>Total</b>	<b>15 046</b>	<b>16 538</b>	<b>16 637</b>	<b>16 565</b>

### 7.1.6. Age and gender composition:

There were more females than males in the years 1996 and 2001 and more males than females in 2011 and 2016. Over the period from 1996 to 2016, the number of females increased by 663 persons, whilst that of males increased by 857 persons.

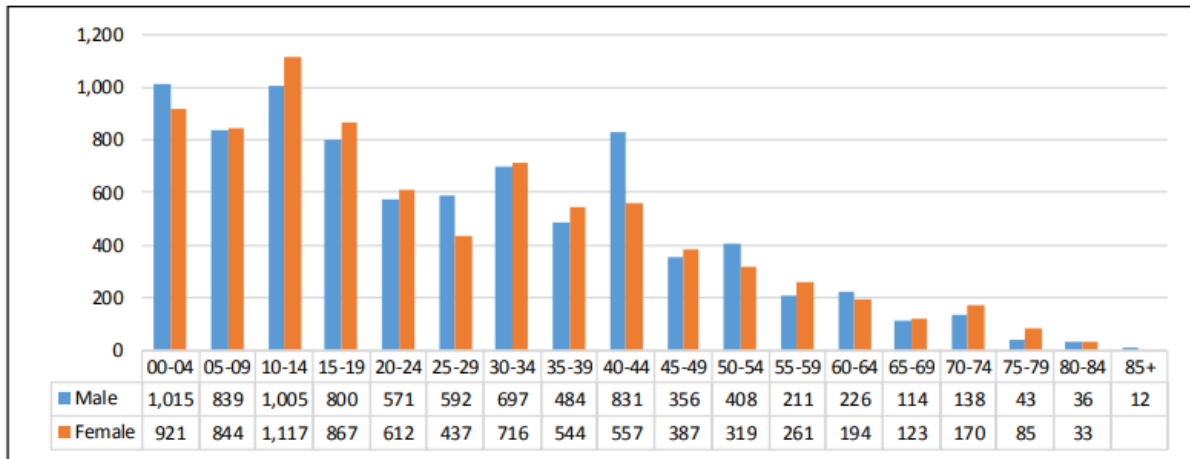


Figure 14: Pie chart illustrating the distribution of the total population by age group and gender in !Kheis municipality by gender in 2016.

### 7.1.7. Educational and employment demographics:

There is an improvement observed in the level of education in the !Kheis Local Municipality over the period 1996 to 2016, where there was a decline in the percentage of people aged 20 years and above with no schooling from 26.8% in 1996 to 11.7% in 2016. An increase is also observed in the percentage of people having a matric qualification over the period from 1996 to 2016 from 6.6% to 18.0%.

Table 13: Table of the highest level of education for person's aged 20 years and above, 1996-2016

	No schooling	Some primary	Complete primary	Some secondary	Grade 12/Std 10	Higher	Total
<b>Number</b>							
<b>1996</b>	2 103	2 346	911	1 660	520	311	<b>7 851</b>
<b>2001</b>	2 072	2 795	1 004	2 120	972	355	<b>9 317</b>
<b>2011</b>	1 232	2 360	894	2 945	1 278	413	<b>9 122</b>
<b>2016</b>	1 062	1 689	873	3 526	1 638	315	<b>9 101</b>
<b>Percent (%)</b>							
<b>1996</b>	26.8	29.9	11.6	21.1	6.6	4.0	<b>100.0</b>
<b>2001</b>	22.2	30.0	10.8	22.8	10.4	3.8	<b>100.0</b>
<b>2011</b>	13.5	25.9	9.8	32.3	14.0	4.5	<b>100.0</b>
<b>2016</b>	11.7	18.6	9.6	38.7	18.0	3.5	<b>100.0</b>



### 7.1.8. Economic characteristics:

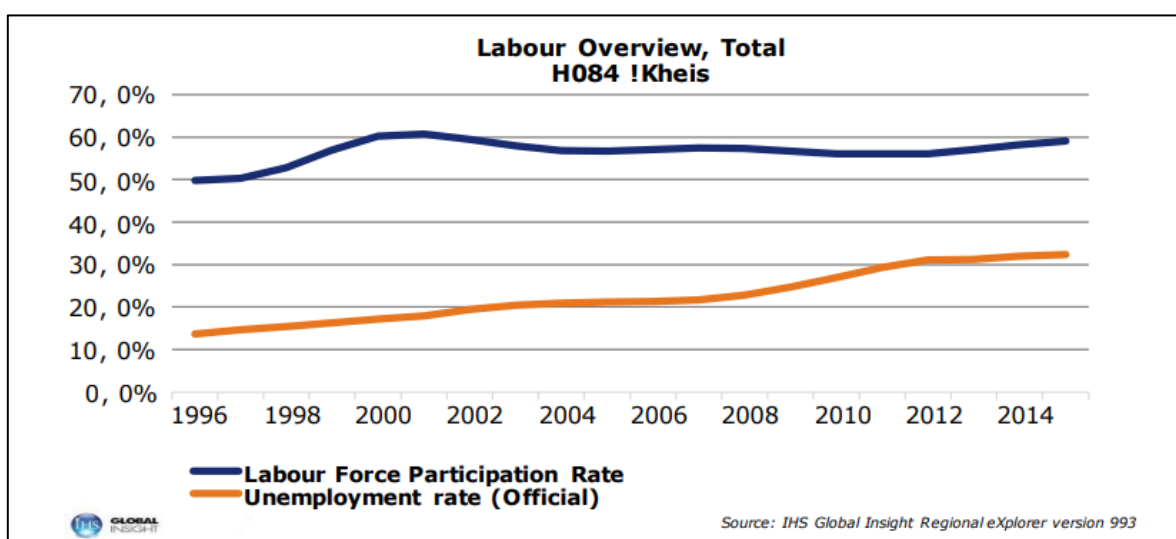


Figure 15: The employment rate in !Kheis areas from 1996-2014

There was an increase in the employment rate in !Kheis municipal area from 50% to 60% from 1996 – 2001 and slightly decreased from 60% - 59% from 2002 – 2014. The unemployment rate was observed to increase in 1996 – 2003 from 18% - 21% although it remained constant at 21% from 2004 – 2007 whereafter it dramatically increased from 21% - 32% in 2008 – 2014 because of exporting the agriculture industry. Only a small number of people in !Kheis are highly skilled and are currently attending any tertiary education at higher institutions and the seasonal economic activities taking place in the agriculture sector which has a direct impact on the skills development levels and employment rate in the area.

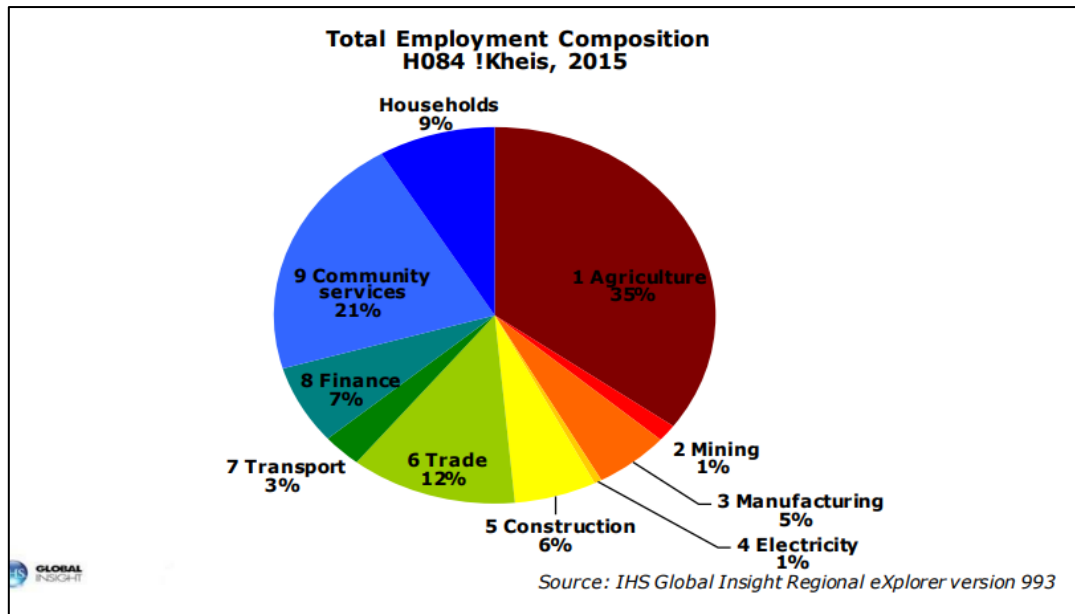


Figure 16: The total employment composition of the !Kheis Local Municipality

The agricultural sector is still the main economic sector. The commercial farmers, farm particularly with sheep for meat production, while the emerging farmers farm with both sheep and goats. Provincial Government and Farm Africa are involved by capacitate the emerging farmers in sustainable farming and bookkeeping.

## 8. Specialist investigations

According to Regulation 19 (1), of the 2014 BA Regulations (as amended in 2017), a Basic Assessment Report must include specialist reports.



### Introduction:


The compilation of this document required niche-specific expertise, specifically in the fields of terrestrial and aquatic ecology, palaeontology, anthropology, and ornithology. Experts in these fields were appointed for the compilation of specialist reports which reported on the *in-situ* condition of the receiving environment and the anticipated impacts associated with the proposed development. This section outlines the assessment methodology and findings of the various specialist studies conducted (for more detailed information refer to **Appendix H**).

### Methods:

#### 8.1.1. Avifaunal Impact Assessment:

A site visit was conducted from 22 to 27 August 2022 with a focus on an area of 5 km around the Orange River Solar Facility 1 (ORSF1) power line (Refer to **Appendix H**). The aim was to gain first-hand knowledge of site-specific issues related to the potential impact of the ORSF1 power line on birds. Throughout this period, birds heard and or seen were recorded on a custom Android app which automatically recorded the date, time and observer location for each observation. The fieldwork included the following:

-  Bird activity at the Orange River crossing site. During the late afternoon of the 22nd and the early morning of 23 August 2022, the movement patterns of birds were recorded at the Destination River Resort campsite riverfront. Miscellaneous observations were also made at or near this site at other times.
-  Transects were conducted on foot, with the area covered indicated in **Figure 3**. At least 5 minutes was spent in each 12-second block traversed, even if a transect only cuts through a small part of a block.
  - Power line transects were conducted to check on power line-related bird casualties. Details about the sections along the ORSF1 power line are illustrated in **Figure 9** (refer to **Appendix H**).
    - \* 132kV Garona–Groblershoop (GAR/GRO) power line: From pylon 1 GAR/GRO 82 at the Orange River north-eastwards to pylon 1 GAR/GRO 68, a total distance of 3.5 km.
    - \* 22 kV Groblershoop–Padkloof (GPF) power line: From pylon GPF 15 at the Orange River north-eastwards to pylon GPF 58, a total distance of 4.0 km.

 Vehicle transects: Transects were conducted by vehicle on various roads up to 5 km from the ORSF1 power line. In most cases, at least 5 minutes was spent in each 1-minute block traversed, even if a transect only cuts through a small part of a block.

A species list has been compiled along with distribution patterns, habitat preferences, breeding on pylons, and impact significance regarding the avifaunal theme of this development (for more detailed information refer to **Appendix H**).

### **8.1.2. Freshwater Ecological Assessment:**

The proposed linear development area and the approximate 200 m corridor surrounding the proposed transmission line route, were assessed on foot. Visual observations/identifications were made of any significant watercourses/wetlands and/or other ecologically sensitive/conservationally significant aquatic features/habitats and their conditions, as well as relevant aquatic species present. Identified aquatic species were listed and categorised as per the Red Data Species List; Protected Species List of the National Forests Act (Act No. 84 of 1998), Invasive Species List of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Alien and Invasive Species Regulations, 2014 as well as the Provincially Protected species of the Northern Cape Nature Conservation Act (Act No. 9 of 2009). Any significant watercourses/wetlands and/or other ecologically sensitive/conservationally significant aquatic features/habitats which were found to be present within the proposed linear development area and the approximate 200 m corridor surrounding the proposed transmission line route, were identified, delineated and discussed.




Georeferenced photographs were taken of any significant watercourses/wetlands and/or other ecologically sensitive/conservationally significant aquatic features/habitats, as well as any Red Data Species Listed-, nationally- or provincially protected aquatic species if encountered. This was done in order to indicate their specific locations in a Geographic Information System (GIS) mapping format. Potential aquatic ecological impacts of the proposed development on the surrounding aquatic environment were identified, evaluated, rated and discussed. The Present Ecological State (PES) as well as the Ecological Importance and Sensitivity (EIS) of the identified aquatic features were also determined and discussed (for more detailed information refer to **Appendix H**).

### **8.1.3. Phase One Heritage Impact Assessment:**

The significance of the affected area was evaluated using existing field data, database information and published literature. This was followed by a field assessment (site visit) of the affected areas. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant

archaeological and palaeontological information, maps, Google Earth images and site records were integrated with data acquired during the on-site inspection.




Terms of reference:

-  Identify and map possible heritage sites and occurrences using available resources.
-  Determine and assess the potential impacts of the proposed development on potential heritage resources;
-  Recommend mitigation measures to minimize potential impacts associated with the proposed development.






#### **8.1.4. Visual Impact Assessment:**

Within the study area observers experience and interact differently with their environment and therefore value it differently. They may be affected by the proposed project due to additions or alterations in the visual environment which may influence their experience and views of the visual environment. In this assessment, a distinction is made between impacts on the observers and impacts on the landscape character. The observers represent all people and their views that may be affected due to their exposure to a source of impact, while the impacts on the landscape character strictly assess the changes to the landscape's character and the impact on its visual value, regardless of the presence of observers. Although impacts may be similar in nature, a highly significant impact on the observers will not necessarily be a highly significant impact on the landscape character and vice versa.

The following typical impacts may be expected as a result of the construction and operation of the proposed project:

-  The project activities and components noticeably change the existing features and qualities of the landscape which may include its scenic quality, sense of place or perceived character;
-  The project introduces new features which are uncharacteristic or in contrast with the existing character of the landscape or may interfere with the views of the observers; and/or
-  The project removes, blocks or interferes with aesthetic features in the landscape which subsequently contributes to the visual value and aesthetic quality of the visual resource.

A VIA is a specialist study that assesses the potential visual changes/impacts to an existing baseline setting resulting from the implementation of a proposed project. This implies that, firstly, a baseline must be established and secondly, the visual change, resulting from the project, must be compared to the baseline. The quantification of the visual change is referred to as the severity of the impact and is a function of:

-  The nature of the impact;
-  The probability of the impact occurring;
-  The duration of the impact;
-  The extent of the impact; and
-  The magnitude of the impact.

The essence of determining the significance of a visual impact, centres on the severity of the potential impacts, and the sensitivity of the affected receptors. In simple terms, a low severity impact affecting receptors of low sensitivity, will result in a low significance. On the other end of the scale, a highly severe impact, affecting highly sensitive receptors, will result in a high significance (Refer to **Appendix H**).

### **8.1.5. Terrestrial Ecological Assessment:**

#### **Survey:**

Before visiting the site, a desktop study commenced where the following information was determined:

- 🔦 Vegetation type.
- 🔦 Climatic conditions.
- 🔦 Probable rare- endemic- and protected species<sup>1</sup>.
- 🔦 Relatively homogenous vegetation units in which surveying will commence.
- 🔦 Probable environmental impacts of the proposed development.
- 🔦 The [iNaturalist](#) website was also consulted to obtain probable species presence as identified by the general public and other specialists.

Surveying took place in early spring, before the first good rains of the season. As a result, most species observed on site are perennial. The diversity of perennial species observed underrepresents the potential diversity of annual and geophytic species which could occur on site. Thus, the number of species observed is an underestimate of the potential number of species that could occur on site.


The survey was performed by means of transects traversed on foot. The use of an unmanned aerial vehicle (UAV) flying at a maximum altitude of 80 m was used to aid the delineation of relatively homogenous vegetation units. Plant species observed were recorded with particular emphasis on rare-, endemic-, protected- and dominant species. Attention was given to the current state of the environment regarding grazing impacts, anthropogenic disturbances, erosion, and the presence of alien or invasive species. Observed animal species and evidence of their existence (dung, habitat requirements, excavations, animal tracks, burrows, and nests) were recorded.

#### **Literature used for additional information:**

- 🔦 *Red Data List (Raimondo et al. 2009).*
- 🔦 *Vegetation types (Mucina and Rutherford, 2006; SANBI, 2006-2018).*
- 🔦 *Botanical Assessment of the Destination Rock Inn Resort Development, Groblershoop Portion 18 of Farm 387) (van Rooyen and van Rooyen, 2018).*

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<sup>1</sup> SANBI was consulted prior to the site visit to attain the species names of Rare, threatened and or protected floral species as identified through the DFFE Screening Tool.

 *Field guides used for species identification (van Wyk and Malan, 1998; Botha, 2001; van Rooyen et al., 2001; Bromilow, 2010; van Wyk and van Wyk, 2013; van Oudtshoorn, 2014; Manning, 2019).*



**For more information, please refer to Appendix H.**

### **Summary of findings:**

The specialist assessments aim to identify potential environmental impacts that could result from the proposed development. The various impacts need to be evaluated with regards to its significance and highlighting the key issues to be addressed (for more detailed information refer to **Appendix H**). The following sections summarise the main findings from the specialist reports regarding the key issues identified during the BAR process

#### **8.1.6. Avifaunal assessment:**

This assessment is based partly on a 5-day site visit and literature survey. More details can be found in the report. Avifauna The distributions of 234 bird species overlap with the Groblershoop study area:

-  Red Data species (n = 15): Present indications are that the territory of at least one Karoo Korhaan R235 group overlaps marginally with the footprint itself. A few other Red Data species could also be residents in the area. However, they likely roam over a relatively wide area, and their use of the footprint area is provisionally considered to be primarily transitory (Secretarybird R118, Lanner Falcon R172, Kori Bustard R230 & Ludwig's Bustard R232). The Abdim's Stork R085 is a non-breeding trans-equatorial intra-African migrant expected to visit the agricultural fields in relatively large numbers during summer. The remainder of the Red Data species is all expected to be infrequent visitors to the area.
  - Six Red Data species also appear in CMS lists A1, W, R1 & R2. Only Abdim's Stork R085, a non-breeding trans-equatorial intra-African migrant, and Lanner Falcon R172 are considered relatively common in the area (see status above). The remaining four are expected to be infrequent visitors to the area.
-  Endemic species (n = 18): Include four Red Data species. The Karoo Korhaan R235, Karoo Thrush R577a, Karoo Scrub Robin R614, Namaqua Warbler R687, Fiscal Flycatcher R698 and Fairy Flycatcher R706 are the only endemic species which are probably resident in the proposed footprint area. None of the remaining 12 endemic species appears to be residents in the footprint area. However, some may be residents in adjacent areas and/or visit the footprint area occasionally.
  - – The only endemic CMS species is the Black Harrier R168 (R1), possibly an infrequent transitory visitor to the study area.

- 💡 Other species (n = 205): Many utilise or are expected to utilise, the footprint area.
  - – They include 42 CMS species, many of which are relatively common in the study area.

Potential avifaunal impacts were assessed of the 3.88 km long, 132 kV ORSF1 power line planned to connect the proposed Orange River Solar Facility 1 to Eskom's High Voltage Groblershoop substation. A synopsis of the results is presented in the executive summary (**Appendix H**). The ORSF1 power line will be a permanent collision hazard to the area's birds, probably for decades. The proposed power line route intersects several flyways and passes near a known roost, as well as another spot in the Orange River that is likely to attract large numbers of birds during certain times of the year. There is, thus, a high probability that collisions will occur. Although biologically significant impacts are improbable, collision incidents could trigger a public response, which may become a public relations nightmare in a worst-case scenario. Even more importantly, the ORSF1 power line poses a real collision risk to a few Red Data species and a number of species listed in various Convention on the Conservation of Migratory Species of Wild Animals (CMS) lists. Collision impacts are the most significant concern, with electrocutions in a distant second place. Whereas a proven, reliable, cost-effective strategy that works for all species all the time does not currently exist for collision mitigation, mitigation strategies for electrocution have most, if not all, of these features. The only significant cumulative impact identified relates to the increase in the total length of power lines throughout the Northern Cape. The ORSF1 power line will contribute 3.88 km to this. A sustained increase over time could have negative consequences for non-resident species such as the Endangered Ludwig's Bustard R232. Collision and electrocution impacts are only relevant during the operational phase of the ORSF1 power line. There are also impacts associated with this line's construction and decommissioning phases. These phases are of short duration, and their respective impacts pale compared to the operational phase. In conclusion, it is recommended that the activity is authorised on the condition that the proposed mitigation measures are strictly implemented.

#### **8.1.7. Freshwater ecological assessment:**

The proposed transmission line will respectively traverse a single (1) and three (3) significant first-and second-order ephemeral watercourses on the western and eastern sides of the Orange River. These watercourses constitute the main surface water flow paths of the small local catchment towards the river. From a hydrological perspective, the watercourses therefore form an important part of the local surface water catchment and drainage. Although the proposed transmission line route does not fall within any Important Bird Areas (IBA) (see under heading 9.3 refer to **Appendix H**), the increased woody densities associated with the watercourses potentially provide important refuge and locally distinct habitat for common and habitat-specific bird-, reptilian-, small antelope- as well as other mammalian species. The watercourses are therefore



viewed as being of low to moderate conservational significance/value, from a semi-aquatic ecological perspective.

The proposed transmission line will respectively traverse a single (1) and five (5) small first-order ephemeral preferential water flow paths/drainage lines on the western and eastern sides of the Orange River. These flow paths/drainage lines assist with channelling and discharging surface water runoff into the significant watercourses associated with the proposed development. The flow paths/drainage lines therefore merely play an assisting role in the small local catchment towards the river and are not viewed as being of high conservational significance, from a hydrological perspective. The flow paths/drainage lines are merely viewed as being of low conservational significance/value, from a semi-aquatic ecological perspective.

Once the construction phase of the proposed development has been completed, the subsequent operational phase should not result in any significant additional potential aquatic ecological impacts, apart from the potential long-term aquatic ecological impact. The significant potential long-term aquatic ecological impacts identified for the proposed development, could potentially merely add low to moderate cumulative impact to existing negative impacts caused by the extensive existing agricultural cultivation transformation, along the local and broader length of the Orange River (for more detailed information refer to **Appendix H**).

#### ***8.1.8. Phase 1 heritage impact assessment:***

Sections 1 and 2 of the proposed powerline footprint traverse metavolcanic-metasedimentary rocks and bedrock – derived, gritty to gravelly top soils, as well as sheetwash/alluvial deposits along in low-lying areas. Section 3 traverses the river and its adjacent floodplain deposits, the latter severely degraded by modern farming and other commercial activities. No evidence was found of in situ Stone Age archaeological material, either as capped assemblages or distributed as intact surface scatters on the landscape within the boundaries of the proposed linear development. Low density (< 1 / 100 m) isolated finds include weathered, cf. LSA flakes and associated debitage made on banded ironstone. There are no indications of rock art (engravings), stonewalled structures or historically significant buildings older than 60 years, or aboveground evidence of graves or cairns within the boundary of the proposed linear footprint (for more detailed information refer to **Appendix H**).

The proposed development footprint is underlain by palaeontologically insignificant metamorphic rocks. Impact on potential palaeontological heritage resources within floodplain deposits (alluvium, left & right bank of the river) is considered low as it has been severely degraded by modern farming and commercial activities. The field assessment provided no aboveground evidence of prehistoric structures, buildings older than 60 years, or material of cultural significance or in situ archaeological sites within the study area. Given the nature of the underlying geology, potential impact on rock engraving sites within the study area is considered unlikely. The proposed

development footprint is not considered palaeontologically or archaeologically vulnerable and is assigned a site rating of Generally Protected C.

#### **8.1.9. Visual Impact Assessment**

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

The sources of visual impacts will originate from the construction activity and the presence of a workforce and machinery operating during the construction process. When this is complete, the newly constructed powerline will remain a source of impact as its presence will result in a change to the existing baseline environment. During both phases, inherent mitigating factors for example screening by the topography/vegetation and distance from the source of impact, will influence the Visual Absorption Capacity (VAC) and Zone of Visual Influence (ZVI). The inherent mitigation factors are not enough to completely eliminate the potential impacts, and additional mitigation measures should be considered.

Observers in the study area will be affected differently by the potential impacts, due to their distance away from the source of impact and their sensitivity towards their visual environment. Residents and tourists residing or entering the Zone of Maximum Visual Exposure (ZMVE) are considered the most sensitive observers in the study area. These are limited to the residents of Groblershoop, the surrounding farmers and tourists seeking lodging at the accommodation facilities in the ZMVE. Their exposure to the impacts is expected high to medium and at least a portion of the powerline will be visible to viewers inside the ZMVE. The significance of impacts is the highest on residents and tourists inside the ZMVE if no mitigation is implemented.

The landscape character will experience a transformation as a result of the new powerline. The completed project will introduce a new 4km powerline to a landscape that is valued for its natural beauty and picturesque agricultural land use. These features are central to the sense of place and the scenic quality of the study area. A new powerline will noticeably change the baseline environment, thereby detracting from the current values and qualities of the natural features and the scenic quality associated with the agricultural fields. The significance of impacts is the highest on the Orange River and agricultural landscapes if no mitigation is implemented.

A very high risk of cumulative impacts is likely as the powerline route is also shared with other existing powerlines in the same corridor. The proposed powerline will increase the visual dominance of power infrastructure, thereby compounding the negative affect on views towards valued landscape features and reducing scenic

quality of the landscape character. Cumulative impacts can only be effectively reduced with the implementation of drastic design alterations as recommended mitigation.

Residual risks can be effectively reduced if a drastic design alteration is implemented, in particular the consolidation of existing powerlines or underground cabling. If this is not an option, residual risks will remain, as the powerline cannot be effectively mitigated with remediation or reduction strategies.

Impacts can be marginally mitigated during the construction phase, but little can be done to mitigate impacts during the operational phase unless major design changes are considered. One such consideration is the avoidance of a new powerline and the construction of an underground cable or the consolidation of parallel lines on a single powerline. This is subject to technical and cost-benefit scrutiny. An alternative, but less preferred option, is the rerouting of the powerline to avoid areas of sensitive visual and landscape receptors. These are considered the most effective mitigation measure to address the potential impacts.

No fatally flawed impacts are identified, but the significance of impact on the highly sensitive landscapes, are considered major and require mitigation intervention to prevent further loss in scenic quality and visual value (for more detailed information refer to **Appendix H**).

#### **8.1.10. Terrestrial ecological assessment:**

A previous ecological assessment performed in August of 2018 by van Rooyen and van Rooyen for the eastern part of the site (on the eastern side of the Orange River) was available for reference and was largely influential in this study.

The site consists of multiple vegetation units with varying overall vegetation layer characteristics. Overall, the tree layer is moderately developed in certain areas, while absent in others. The shrub layer is moderately developed throughout the site. Poor to moderately developed graminoid and herbaceous layers are consistent throughout the study area. The overall vegetation, excluding the dune and riparian areas, are a good representative of the Bushmanland Arid Grassland. Neighbouring vegetation types, Gordonia Duneveld vegetation, is represented by the dune areas within the study area, while the riverine and riverine island vegetation resembles the Lower Gariep Alluvial Vegetation (Mucina and Rutherford, 2006; SANBI, 2006-2018; Skowno et al., 2018).

The DFFE screening tool has indicated the floral theme to be of low sensitivity. The known occurrence of three floral SCC and numerous provincially protected flora in the surrounding vegetation is better associated with a high floral sensitivity theme. The supporting evidence for this has been supplied as per the specialist protocols in a separate specialist report. As these species were not directly found within this ecological report study area the inclusion of this, the supporting evidence has been excluded.

Anticipated environmental impact evaluation has overall indicated that the development would have a low anticipated environmental impact. A low environmental impact was greatly influenced by the proposed transmission lines overall few direct impacts. As per the EIA species guidelines, avoidance mitigation alternatives should be investigated for very highly sensitive areas.

## 9. Impact assessment and mitigations

According to Appendix 1, Section 3 (1), of the 2014 EIA Regulations (as amended in 2017), a Basic Assessment Report must include

*“(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;*

The impacts arising from the proposed development’s design, construction, operation, and decommissioning phases have been assessed. A summary of the findings is presented in this chapter. Refer to **Appendix I** for an in-depth methodology, rationale, impacts and mitigations description.

### **Design and planning phase:**

Activities associated with the design and pre-construction phase are primarily restricted to planning and design around the proposed development. As such, this phase relies largely upon on-site inspections and desktop assessments. Therefore, the impacts limited to this phase are considered insignificant.

### **Construction phase:**

Impacts limited within the construction phase have far more significant consequences compared to the design and planning phase of the proposed development. During this phase, the environmental impacts occur as both direct and indirect impacts associated with the disturbance of a naturally functioning ecosystem. Any disruption, whether small/concentrated or large/expansive, will adversely influence a naturally functioning ecosystem. The severity and consequences depend on the type of development, the extent of disturbance, the severity and the environment's ability to recover from such disruptions. The construction/ development of a sub-transmission line typically requires the displacement of relatively small areas. As such, the impact assessment contained within this report diligently assessed all relevant and possible environmental impacts which may be generated due to the construction of the proposed powerline.

### Operational phase:

During the operational phase, much of the directly affected environment has a very small footprint and will mostly be affected only during the operational phase of the development. As such direct environmental impacts are likely to negatively impact energy transfers between biota. Such interferences include obstruction of natural migration behaviour, soil erosion etc. Indirect positive environmental impacts are derived from the connection created from the powerline between Eskom's substation and the proposed solar facility. The operational phase of the proposed powerline provides an undoubtedly positive socio-economic benefit. Positive socio-economic benefits include job creation, the positive feedback luring in investment opportunities, and local economic boost. Although, according to the visual impact assessment conducted the visual impact occurring from the powerline would impede the landscape appreciation, resulting in a slightly negative impact.

### Decommissioning phase:

It is unlikely that the proposed powerline and its associated infrastructure will be decommissioned as it is envisaged to continue for the foreseeable future. In the unlikely event of decommissioning, the impacts would be expected to be of similar degree to the construction phase, albeit likely of lower intensity and consequence.

### Summary of impacts:

The table below summarises the assessed impacts and their significance pre-and post-mitigation. Refer to the full environmental impact assessment for more details.

Table 14: Environmental impact assessment summary.





Impact type	Phase	Status	Significance pre mitigation	Significance post mitigation
<b>Aspect: Ecological impacts</b>				
<b>Habitat loss</b> <i>Loss of habitat and species diversity as a result of construction and the removal natural elements.</i>	Construction	Negative	Medium (15)	Low-Medium (6)
	Operation	N/A	N/A	N/A
<b>Invasive plant species</b> <i>Proliferation of exotic plant species due to environmental disturbance.</i>	Construction	Negative	Low-medium (6)	Low (1)
	Operation	Negative	Low (4)	Low (1)

<b>Loss of floral and faunal SCC</b>	Construction	Negative	Medium-high (16)	Low-medium (9)
<i>The loss of floral and faunal species of conservation concern as a result of the proposed development.</i>	Operation	N/A	N/A	N/A
<b>Loss of ecological support areas (ESA)</b>	Construction	Negative	Medium (12)	Low-medium (6)
<i>The loss of ESA areas due to the proposed development.</i>	Operation	N/A	N/A	N/A
<b>Cumulative impacts</b>	Construction	Negative	Low-medium (10)	Low-medium (8)
<i>The cumulative impact on the receiving environment's ecology regarding the proposed development total footprint assessed in conjunction with other renewable developments in a 30 km radius.</i>	Operation	N/A	N/A	N/A
<b>Aspect: Heritage impacts</b>				
<b>The loss of artefacts and fossils</b>	Construction	Negative	Low (4)	Low (1)
<i>Destruction of any archaeological artefacts or fossils.</i>	Operation	N/A	N/A	N/A
<b>Aspect: Water resource impacts</b>				
<b>Surface and ground water quality</b>	Construction	Negative	Medium (12)	Low-medium (6)
<i>The pollution of surface and groundwater resources due to the proposed development.</i>	Operation	N/A	N/A	N/A
<b>Aspect: Aesthetics</b>				
<b>Construction of infrastructure</b>	Construction	Negative	Medium (12)	Low-medium (6)
<i>The alteration of landscape appreciation, visual deterioration and visual impacts from the powerline.</i>	Operation	Negative	Low – Medium (6)	Low (2)




<b>Aspect: Air quality and noise</b>				
<b>Air quality</b> <i>Additional air pollution introduced due to the mobilisation of vehicles and land clearance.</i>	Construction	Negative	Low-medium (9)	Low (4)
	Operation	N/A	N/A	N/A
<b>Noise and vibrations</b> <i>Sound pollution through the operations of vehicles and equipment.</i>	Construction	Negative	Low-medium (9)	Low (4)
	Operation	N/A	N/A	N/A
<b>Aspect: Socio-economic impacts</b>				
<b>Job creation and the influx of job seekers</b> <i>Impacts associated with the need for locally appointed construction/ operation workers.</i>	Construction	Positive	Medium (12)	N/A
	Operation	Positive	Low (4)	NA
<b>Aspect: Waste impacts</b>				
<b>General solid waste</b> <i>General solid waste pollution.</i>	Construction	Negative	Low-medium (9)	Low (4)
	Operation	Negative	Low-medium (9)	Low (2)

### **No go alternative**





The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not constructing the proposed development. This alternative would result in no environmental impacts on the site or surrounding local area. It provides the baseline against which other alternatives were compared. The following implications will occur if the “no go” alternative is implemented:

-  No benefits will be derived from the implementation of an additional land-use.
-  The Orange River Solar Facility 1 will be unable to supply energy to the Eskom’s (high voltage) substation.
-  This will further enforce more strain on the already outdated electrical grid.
-  Considering the national grid is largely supplied by non-renewable energy production facilities (90% coal based), the no go option will indirectly result in more carbon dioxide emissions.



-  The authorisation refusal of this sub-transmission line will directly create a precedence which will prevent the supply of green energy to the substation and indirectly deter future renewable energy developments in the area.
-  Socio-economic benefits such as job creation, skills development, and local economic growth will be lost.
-  Local economic benefits will not be realised.

Besides the above mentioned, the following benefits might occur if the no go alternative is implemented:

-  No vegetation will be removed and or disturbed.
-  The ecology will remain largely intact.
-  No change/ alteration to the existing landscape.
-  No additional waste will end up in landfill sites.

While the no go alternative will not generate any negative environmental impacts, it will surely remove any socio-economic benefit the local community will receive. The no go alternative will also not aid the government in addressing climate change, reaching its greenhouse gas emission targets, and will further place more strain on the existing electrical grid. Therefore, the **no go alternative** is **not considered the preferred alternative**.

## 10. Project summary and recommended mitigations

Approximately 3.5 km long, the proposed transmission line will connect the proposed photovoltaic solar facility to the national grid through the selected Eskom sub-station.

Approximately 2.6 km North of Groblershoop, the entrance to the farm Rooisand and Destination River Resort can be found to the left of the N8, a little past the Orange River bridge. Development of the proposed transmission line will affect the vegetation of a roughly 100 m wide servitude footprint area underneath the transmission line (10x10 m<sup>2</sup> on around the foot of the transmission line pylons). Transmission lines require service roads, which would increase the actual area that would be influenced by the proposed development. However, the presence of an existing high voltage transmission line running near parallel to the proposed transmission line has an existing service road. Although existing roads can be used, which lowers the actual area that will be influenced by the proposed development, the development of a service road is still required for the new proposed powerline.

The northern sections of the transmission line will occur on steeply to gently undulating hillsides. Gently inclining floodplains along the orange river mark the southern areas of the transmission line, which experiences less undulating topography.



The following specialist studies was conducted:

- Aquatic Ecological Assessment – *AJH Lambrecht (EcoFocus Consulting Services)*
- Phase 1 Heritage Impact Assessment – *Dr L Rossouw*
- Avifaunal Impact Assessment – *Mr. J van Niekerk*
- Terrestrial Ecological Impact Assessment - *Ms. E Ferreira and Mr. R Nel*
- Visual Impact Assessment - *Mr. M van den Berg*


The overall impact assessment resulted in the following:


Ecological impacts had an overall medium score before mitigation and low-medium after mitigation. The overall heritage impacts were low and the overall low-medium impact before mitigation and low after mitigation. The overall aesthetics impacts scored medium to low-medium after mitigation. Air quality and noise had an overall low-medium impact to low during the construction phase and a low impact during operational phase. The waste impacts were both scored low-medium prior mitigation and low after mitigation. The socio-economic impacts were overall positive.


The following mitigations were identified:


-  Vegetation clearance must be restricted to the pylon locations and the narrow linear route of the proposed transmission line access/service road, as far as practicably possible.
-  It is recommended that all individuals of the identified alien invasive species must be actively eradicated from the Orange River riparian zone and the relevant watercourse, in accordance with the requirements of the National


Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Removed materials must also be adequately and lawfully disposed of, in order to prevent potential further spreading/dispersal.


 It is recommended that no pylons may be constructed within the Orange River riparian zone. This must be done in order to prevent significant disturbance of the riparian zone and its associated conservationally important and locally distinct faunal habitat and to subsequently maintain/ensure the ecological functionality and -integrity of the riparian zone, over time.


 It is recommended that the pylons on the eastern and western sides of the Orange River to cross the river, be placed parallel with the existing pylon locations of the existing Eskom line, as these have been constructed a suitable distance away from the riparian zone.


 It is furthermore recommended that the transmission line be suspended as high as practicably possible across the Orange River and that adequate bird deflecting/deviation technologies be implemented along the transmission line. This must be done in order to attempt to prevent significant collision- and mortality risks to waterbirds and other avifauna that utilise the river.


 It is recommended that no pylons may be constructed inside- or within 35 m of any significant watercourse. The development design layouts of the proposed transmission line must allow for continued flow through the watercourses. This must be done in order to maintain/ensure their ecological functionality and - integrity over time.

 It is recommended that no pylons may be constructed inside- or within 20 m of any preferential water flow path/drainage line. The development design layouts of the proposed transmission line must allow for continued flow through the flow paths/drainage lines. This must be done in order to maintain/ensure their ecological functionality and -integrity over time.

 It is recommended that the pylons be placed parallel with the existing pylon locations of the existing Eskom line, as far as practicably possible, as these have been constructed a suitable distance away from the watercourses and flow paths/drainage lines.

 Disturbed areas within and immediately surrounding the proposed Orange River-, watercourse- and flow path/drainage line crossings, must be adequately rehabilitated concurrently with the construction processes. A Rehabilitation Management Plan must be compiled by a suitably qualified and experienced ecologist.

 An adequate Stormwater and Erosion Management Plan must also be implemented during the construction- and operational phases of the proposed development, in order to assist with and allow for continued flow within the local catchment. This must be done to sufficiently manage storm water runoff and clean/dirty water separation in order to attempt to maintain/ensure the ecological functionality and -integrity of the local and broader quaternary surface water catchment- and drainage area.

 A Water Use License Application (WULA) must furthermore be submitted to the Department of Water and Sanitation (DWS), to request authorisation for the proposed development across the Orange River as well as through the four (4) watercourse- and six (6) flow path/drainage line crossings, associated with the proposed transmission line route, in accordance with the National Water Act (Act 36 of 1998).

### **EAP's Recommendations**

The EAP(s) recommends that the proposed 132 kV sub-transmission line be authorized at the proposed location. All mitigation measures listed by the specialists in their specialist reports and proposed in the Environmental Management Programme (EMPr) must be implemented.

## 11. Appendices

**Appendix A: MAPS**

**Appendix B: EAP Details**

**Appendix C: Site photographs**

**Appendix D: Structure plans**

**Appendix E: PPP report**

**Appendix F: Title deeds**

**Appendix G: Screening tool**

**Appendix H: Specialist studies**

**Appendix I: Impact Assessment and Mitigations**

**Appendix J: Generic EMPr**

**Appendix K: Pre-Application Meeting Minutes**

**Appendix L: Affected Properties and Coordinates**

**Appendix M: General Authorisation**

**Appendix N: Water Use Licence**