



ARCUS

VOLUME I

BASIC ASSESSMENT REPORT FOR THE PROPOSED DEVELOPMENT OF THE UP TO 400 kV DE AAR 2 SOUTH TRANSMISSION LINE AND SWITCHING STATION, NORTHERN CAPE PROVINCE

On behalf of

MULILO DE AAR 2 SOUTH (PTY) LTD

APRIL 2021

DRAFT FOR PUBLIC COMMENT



Prepared By:

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PROJECT DETAILS

DEFF Reference Number:	To be allocated upon submission		
Arcus Reference No:	3457 De Aar 2 South Transmission Line and Switching Station		
Title:	Basic Assessment Report for the Proposed Construction of the up to 400 kV De Aar 2 South Transmission Line and Switching Station, Northern Cape Province		
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Project Applicant:	Mulilo De Aar 2 South (Pty) Ltd		
Report Status:	Basic Assessment Report – Draft for Public Comment		

PUBLIC PARTICIPATION LOCATION DETAILS

The draft BA Report (Arcus, September 2020) was subjected to a 30 day comment period from the 19 October 2020 to the 17 November 2020 (both days inclusive). During the public comment period the application process stopped. The draft BA Report (this report, Arcus, April 2021) has since been updated slightly and is therefore being subjected to another 30 day comment period.

This report is available for public review and comment for a period of more than 30 days from 22 April 2021 to the 24 May 2021 (both days inclusive), taking into consideration Chapter 2 Regulation 3 (1); (2) and (3) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), at the following locations:

- www.arcusconsulting.co.za; and
- Office in De Aar (by appointment only and during business hours 09h00 – 16h00):
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All comments to the submitted to the EAP no later than 24 May 2021.

ABBREVIATIONS, ACRONYMS AND UNITS

BAR	Basic Assessment Report	NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
BESS	Battery Energy Storage System		
CA	Competent Authority	NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
CARA	Conservation of Agricultural Resources, 1983 (Act No. 43 of 1983)	NFEPA	National Freshwater Ecosystem Priority Area
CBA	Critical Biodiversity Area	NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
dB	Decibel	NPAES	National Protected Area Expansion Strategy
DEFF	Department of Environment, Forestry and Fisheries (National)	NSD	Noise-sensitive Development
DMRE	Department of Mineral Resources and Energy	NWA	National Water Act, 1998 (Act No. 36 of 1998)
DoE	Department of Energy	OES	Ostrich Eggshell
DHSWS	Department of Human Settlement, Water and Sanitation	PES	Present Ecological State
EAP	Environmental Assessment Practitioner	PGDS	Provincial Growth and Development Strategy
ECA	Environment Conservation Act, 1989 No. 73 of 1989)	PPA	Power Purchase Agreement
EGI	Electricity Grid Infrastructure	PPP	Public Participation Process
EIA	Environmental Impact Assessment	PV	Solar photovoltaic
EMPr	Environmental Management Programme	REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
ESA	Ecological Support Area	RMPPP	Risk Mitigation Power Procurement Programme
ESA	Early Stone Age	SAHRA	South African Heritage Resources Agency
ESKOM	Eskom Holdings SOC Limited	SANBI	South African National Biodiversity Institute
EWT	Endangered Wildlife Trust	SANRAL	South African National Roads Agency Limited
GNR	Government Notice Regulation	SANS	South African National Standards
HIA	Heritage Impact Assessment	SAWS	South African Weather Service
I&AP	Interested and Affected Party	SCADA	Supervisory Control and Data Acquisition
IDP	Integrated Development Plan	SDF	Spatial Development Framework
IEM	Integrated Environmental Management	SEA	Strategic Environmental Assessment
IPP	Independent Power Producer	SIA	Social Impact Assessment
IRP	Integrated Resource Plan	SPV	Special Purpose Vehicle
kV	Kilovolt	WEF	Wind Energy Facility
kWh	Kilowatt Hours	WULA	Water Use License Application
LSA	Late Stone Age		
MSA	Middle Stone Age		
MW	Megawatt		
NCR	Noise Control Regulations		
NDP	National Development Plan		

EXECUTIVE SUMMARY

Introduction

Mulilo De Aar 2 South (Pty) Ltd ('Mulilo') is applying for environmental authorisation of the proposed up to 400 kV De Aar 2 South Transmission Line and Switching Station (the proposed development). The development is located approximately 15 to 26 km east of the town of De Aar, Northern Cape Province. The proposed development site is located within the Electricity Grid Infrastructure Central Strategic Transmission Corridor as per Government Notice 113, National Environmental Management Act, 1998 (Act No. 107 of 1998).

Two proposed transmission line routes were assessed to connect the authorised De Aar 2 South Wind Energy Facility ('DA2S WEF') (DEFF Ref. No.: 12/12/20/2463/1/AM7) to the existing Eskom Hydra Substation, either following a direct route, or an alternative route via an approved solar PV project (Mulilo De Aar PV, DEFF Ref. No.: 12/12/20/2499), north west of the Eskom Hydra Substation.

Arcus Consultancy Services South Africa (Ltd) Pty ('Arcus') has been appointed to act as project manager and to undertake the environmental impact assessment process for Environmental Authorisation under Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) as amended, for the proposed development.

Site Location and Proposed Development Description

The proposed development, located approximately 15 to 26 km east of the town of De Aar, falls within the Emthanjeni Local Municipality and Pixley ka Seme District Municipality of the Northern Cape Province. The site is bordered in the west by the N10 National road which connects the Northern Cape to the Eastern Cape Province.

Specialists assessed a 200 m¹ corridor (i.e., 100 m on either side of the proposed transmission line alternatives). The two alternatives assessed by the specialists and in this report are described below:

Transmission Line Route 1 (Alternative 1 – The Preferred Alternative) is approximately 23 km in length. This line will connect the authorised DA2S WEF directly to the existing Eskom Hydra Substation near De Aar, in the Northern Cape Province. The entire proposed route follows, and is adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line. From the authorised DA2S WEF on-site substation on the plateau, the proposed line follows a direct route south-west to the existing Eskom Hydra Substation. For approximately 12 km of this route, the proposed line also follows the existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF.

Transmission Line Route 2 (Alternative 2) is approximately 30 km in combined length. This route is split into two parts. Part 1, approximately 5 km in length, runs in a south-easterly direction to connect from the approved solar PV project near De Aar to the existing Eskom Hydra Substation. Part 2, approximately 25 km in length, runs from the authorised DA2S WEF on-site substation to the approved solar PV project. From the DA2S WEF on-site substation, on the plateau, the proposed Part 2 line of Route 2 follows a direct route south-west and is adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line for approximately 20 km. For approximately 8 km of this route, the proposed line also follows the existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF before running in a northerly direction for approximately 5 km to connect to the approved solar PV project.

The proposed transmission line will be an up to 400 kV line (i.e., with a capacity ranging between 66 kV and 400 kV depending on the final design and Eskom requirements), using

¹ The aquatic specialist assessed a corridor of 500 m (i.e., 250 m on either side of the proposed transmission lines).

either steel monopole or steel lattice tower structures with maximum heights of 30 m, and will consist of:

- Foundations and insulators;
- Existing access roads and jeep tracks; and
- Line and servitude clearances to meet the statutory requirements.

Authorisation of an up to 400 kV switching station is also required. The switching station will be located on the plateau, within the authorised DA2S WEF site, alongside the authorised collector substation. The switching station, will have a maximum 100 m x 100 m footprint and will be placed within an assessed area (referred to as the "Switching Station Assessment Area" of approximately 2.8 ha (i.e., approximately 200 m x 140 m)).

Both routes were assessed by the specialists and specialists confirmed that authorisation of both / either route is acceptable. A description of the Preferred Alternative is provided in Section 8 of this BA Report. Based on the alternatives assessed for this application, the applicant is applying for authorisation for Alternative 1 – The Preferred Alternative. This is the preferred alternative from a technical perspective as it connects directly to the Eskom Hydra Substation. Under the Electricity Grid Infrastructure (EGI) as per GN 113 (Central Strategic Transmission Corridor), and for the applicant to benefit with the requirements contained therein, only the preferred alternative must be applied for and can be authorised. The requirements of this are contained in this report (Section 8).

Summary of Findings

The assessment of the proposed De Aar 2 South Transmission Lines and a switching station, located within the Central Strategic Transmission Corridor, has found that there will be no impact on any arable land. In this study area, construction activities will generally have low negative impacts and medium positive impacts on the overall environment. The area within which the development is proposed has been altered by similar developments and so the cumulative effect of this development will be negligible.

The development will be a social and economic benefit to the towns within the vicinity of the development. For construction of this development, the existing Eskom servitude roads will be used as much as possible to limit the use of main roads and impact on privately owned land. As such, it is anticipated that noise and dust levels during construction will be reduced.

In terms of the National Freshwater Ecosystems Priority Areas (NFEPA) assessment, all the watercourses within the site have been assigned a condition score of B (Nel et al. 2011), indicating that they are largely intact and of biological significance. The development would have limited impact on the aquatic environment as for the most part the final placement of the towers could avoid the delineated wetlands and potentially span watercourses. No listed or protected aquatic species were observed during the site assessment. The only natural wetland in the area can be spanned without impact.

Two broad vegetation types occur in the study area, namely the Northern Upper Karoo (NKu3) and Besemkaree Koppies Shrubland (Gh4). The Northern Upper Karoo occurs in the lowland areas of the study site while the Besemkaree Koppies Shrubland occurs on the slopes of koppies and covering the tops of tafelbergs. These vegetation types represent the Nama-Karoo and Grassland biomes. Both of these biomes are fairly structurally homogenous, with few notable different habitat categories.

The low overall impact footprint of the development within the Ecological Support Areas (ESAs), Critical Biodiversity Areas (CBAs) and National Protected Area Expansion Strategy (NPAES) Focus Areas means that the development would not compromise the ecological functioning or the long-term conservation value of the area. In addition, the proposed route/s runs adjacent to existing power lines within an approved reserve, further minimising any potential impacts. Both vegetation types are largely intact with very little prospect of

long-term transformation through agricultural practices, the species and habitats found within them are therefore fairly widespread and not unique to the project site. The power lines and associated infrastructure is unlikely to generate significant impacts on flora and fauna after mitigation. No highly significant negative impacts that cannot be adequately mitigated against were observed, therefore from a terrestrial flora and fauna perspective the development can be supported in terms of its low potential impact to terrestrial ecology.

The areas of avifaunal habitat destruction associated with the footprint of the power line infrastructure, temporary construction facilities and the switching station are relatively small in extent compared to the proportion of untransformed habitat available in the area. A number of Red Data species, and species vulnerable to collisions with power lines exist in the area of the proposed power line route and the impact of collisions to birds has a medium significance even with the implementation of mitigation measures. As the majority of the proposed power line route is adjacent to an existing power line, which is unmarked in terms of bird flight diverters, the impact significance of collision associated with the proposed power line is unlikely to increase beyond that which already exists. Appropriate bird flight diverters, or flappers must be attached to the full length of the proposed power line, and pylons/towers should be staggered as much as possible in relation to the adjacent, existing power lines. The motivation for this requirement is due to the route being within an Important Bird Area (IBA), crossing near cliffs, over drainage lines and farm dams and being in an area important for collision prone species such as Ludwig's Bustard, Blue Crane and Secretarybird. The other potential impacts assessed are of low significance following the implementation of mitigation measures.

A single 300 m High Sensitivity 'no-go' buffer was identified surrounding an active Verreaux's Eagle Nest. This no-go area applies throughout the year. Construction activities in the vicinity of the active Verreaux's Eagle nest should be timed to not occur within the breeding periods of these birds (May, June, July and August), a 500 m buffer around the nests represents a minimum area within which construction activities should not occur during these months.

The transmission lines cross a variety of terrains, from large flat mountain plateau on the eastern side (where the authorised DA2S WEF is located) to flat rocky outcrops, this means that it is visible from any direction within its immediate surrounds. As there are existing electric infrastructure traversing the proposed development site, view from homesteads of these sites has already been impacted by the existing electric infrastructure in the area. Furthermore, dwellings are located further than 500 m from the proposed routes and any transmission line route impacts are negligible for noise assessment, and are thus considered acceptable and will not be investigated further.

A large number of archaeological occurrences which include Middle and Late Stone Age archaeological material, possible historic period stone structures, Khoikhoi stone kraal complexes, some rock engravings and scattered occurrences of historical period archaeological material were identified on site. The volume of and ubiquitous nature of the Middle Stone Age artefacts scattered across the landscape, and the fact that much of this material was found to be in secondary, or disturbed context, means that the combined overall impact of activities associated with this project on Middle Stone Age material will be relatively low. The context of much of the Late Stone Age artefacts noted, appeared to be better preserved than the Middle Stone Age material, and is thus of greater archaeological significance. More occurrences that could be called "sites" were noted with the Late Stone Age material, and the assessment found that if these sites were to be lost or damaged as a result of the construction phase, the impact would be high, although this could be reduced to low through the application of measures.

Previous research, including fieldwork carried out for previous developments, showed that fossils are rare in the area. There is a very small chance of fossils being encountered during the construction of the grid connection and switching station. To mitigate any potential

impacts, it is recommended that a Fossil Chance Find Protocol be implemented at the start of construction, and for the life of the construction which would ensure the conservation and reporting of any finds of fossil material.

The most sensitive road may be the N10, which is a national road connecting from the Northern Cape Namibian border at Nakop, via Cradock, De Aar and Upington to Port Elizabeth on the Eastern Cape coast. The closest view point to the N10 for the proposed development is at the existing Eskom Hydra Substation, which is located approximately 2 km from the road. Although the transmission line will be seen from the N10, the visual and traffic impacts are considered to be low as the character views from the road has already been impacted by the existing electric transmission infrastructure.

The R399 crosses the site in the east, and is more than 6 km from the top of the plateau. This provincial road carries traffic during the day yet is relatively quiet during the night. There are a number of gravel roads traversing the proposed site, mainly used by the farmers in the area. Access to the proposed development is between 2 km and 25 km via the national road, N10 and the town of De Aar is located to the north-west of the proposed development.

Conclusion

The proposed development will have limited impact on the surrounding environment. **Identified impacts can be mitigated to acceptable levels and are generally of low significance.** The proposed lines are within an approved reserve for most part and follows the existing grid connection transmission route of the Longyuan Mulilo De Aar 2 North WEF (existing Hydra Ndhlovu 132 kV Line) and the existing Eskom Hydra Roodekuil 220 kV Transmission Line.

The majority of potential impacts identified to be associated with the construction and operation of the proposed development infrastructure are anticipated to be localised and restricted to the proposed site.

The potentially sensitive areas / environmental features that have been identified include:

- Drainage lines, wetlands and watercourses;
- Sensitive vegetation (such as that associated with the Orange River);
- Heritage sites of significance (Grade II and Grade III sites) in the study area; and
- Bird species of conservation concern.

Although two transmission lines were assessed, authorisation of the Preferred Alternative (Route 1) required. It is the opinion of the EAP that the proposed De Aar 2 South Transmission Line and Switching Station be authorised, subject to the implementation of the required mitigation measures and subject to conditions contained in the Environmental Management Programme.

Summary of Construction Phase Impacts

Construction Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Geology, Soils and Agricultural Potential Impact							
Soil Degradation	L	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>M</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Freshwater & Wetlands							
Loss of riparian system, wetlands and disturbance of the alluvial watercourses	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Sedimentation & Erosion	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Localised surface water quality	M	M	M	Negative	M	L	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Terrestrial Ecology							
Loss of fragmentation of indigenous natural vegetation	L	H	H	Negative	M	L	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>M</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Loss of individuals of threatened or protected plant species	L	H	H	Negative	M	L	H

Basic Assessment Report
De Aar 2 South Transmission Line and Switching Station

Construction Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>M</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Loss of faunal habitat and refugia	L	H	H	Negative	M	L	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>M</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Direct impact to fauna	L	L	H	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>M</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Displacement or disturbance of fauna	L	L	L	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Avifauna							
Destruction of habitat	M	L	M	Negative	L	L	H
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Disturbance / Displacement	L	L	M	Negative	M	H	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Heritage, Archaeology & Palaeontology							
On archaeological resources	L	H	L	Negative	M	H	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>L</i>	<i>Neutral / Positive</i>	<i>L</i>	<i>L</i>	<i>H</i>
On paleontological resources	L	H	L	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>L</i>	<i>Neutral / Positive</i>	<i>L</i>	<i>L</i>	<i>H</i>

Construction Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Visual							
Construction of Infrastructure	M	L	M	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>
Social							
Job Creation	M	L	M	Positive	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	Positive	<i>M</i>	<i>M</i>	<i>M</i>
Influx of job seekers	M	L	L	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>
Safety risk for farmers and farming infrastructure	M	L	M	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>
Impacts of heavy vehicles	M	L	M	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>M</i>	<i>M</i>	<i>M</i>
Risk of potential veld fires	M	L	M	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>
Traffic							
Additional Traffic on major and minor roads	L	M	M	Negative	M	M	M

Construction Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>
Minor road degradation	L	L	M	Negative	M	M	M
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>

Summary of Operational Phase Impacts

Operational Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Freshwater & Wetlands							
Impact on riparian systems	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Impact on aquatic systems	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Sedimentation & Erosion	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Localised surface water quality	M	M	M	Negative	M	L	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Terrestrial Ecology							
Direct faunal impacts	L	M	H	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>M</i>	<i>M</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>

Basic Assessment Report
De Aar 2 South Transmission Line and Switching Station

Operational Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Alien plant invasion	L	H	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Soil Erosion Risk	L	H	M	Negative	M	H	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Avifauna							
Disturbance / Displacement	L	M	M	Negative	M	H	H
<i>With Mitigation</i>	<i>L</i>	<i>M</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Bird mortality from power line collision	M	M	H	Negative	M	H	H
<i>With Mitigation</i>	<i>M</i>	<i>M</i>	<i>H</i>	<i>Negative</i>	<i>M</i>	<i>M</i>	<i>M</i>
Electrocution of avifauna by powered infrastructure	M	M	H	Negative	L	L	H
<i>With Mitigation</i>	<i>M</i>	<i>M</i>	<i>H</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Visual							
Operation of Infrastructure	L	M	L	Negative	M	M	M
<i>With Mitigation</i>	<i>L</i>	<i>M</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>

Summary of Decommission Phase Impacts

Decommission Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Geology, Soils and Agricultural Potential Impact							
Soil Degradation	L	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>M</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Freshwater & Wetlands							
Loss of riparian system, wetlands and disturbance of the alluvial watercourses	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Impact on aquatic systems	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Sedimentation & Erosion	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Localised surface water quality	M	M	M	Negative	M	L	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Social							
Loss of employment opportunities	M	M	M	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>M</i>	<i>M</i>	<i>M</i>
Traffic							
Minor road degradation	L	L	M	Negative	M	M	M

Decommission Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>M</i>

Summary of Cumulative Phase Impacts

Cumulative Phase	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Freshwater & Wetlands							
Hydrological conditions	M	M	M	Negative	M	M	H
<i>With Mitigation</i>	<i>L</i>	<i>L</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>L</i>
Ecology							
Broad-scale processes	L	H	L	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Conservation Objectives	L	H	L	Negative	L	L	H
<i>With Mitigation</i>	<i>L</i>	<i>H</i>	<i>L</i>	<i>Negative</i>	<i>L</i>	<i>L</i>	<i>H</i>
Avifauna							
All impacts on avifauna	M	M	H	Negative	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>Negative</i>	<i>L*</i>	<i>M</i>	<i>M</i>
Social							
Local economy	M	H	M	Positive	M	M	M
<i>With Mitigation</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>Positive</i>	<i>M</i>	<i>M</i>	<i>M</i>

**Impact after mitigation reflects the specialist opinion.*

DEFF: Information Requirements for Transmission Lines and Associated Infrastructure Applications

The Department of Environment, Forestry and Fisheries (DEFF) information requirements for all applications for Transmission Lines and the switching station is included in this section of the report. Where this information is not provided in the tables below, the location of where it can be found in the report is indicated.

Table A: Details of the Affected Farm Properties

Farm Name	Portion Number	Farm Number	SG 21 Code
Wag 'n Bietje	3	5	C03000000000000500003
Wag 'n Bietje	1	5	C03000000000000500001
Wag 'n Bietje	RE	5	C03000000000000500000
Wag 'n Bietje	RE	137	C03000000000013700000
Hydra	RE	144	C03000000000014400000
Carolus Poort	3	3	C0300000000000300003
Carolus Poort	4	3	C0300000000000300004
Carolus Poort	2	3	C0300000000000300002
Slingers Hoek	RE	2	C0300000000000200000
Slingers Hoek	2	2	C0300000000000200002
Wag 'n Bietje Annex C	1	137	C03000000000013700001
Vetlaagte	RE	4	C0300000000000400000
De Aar	1	180	C05700000000018000001

Landowner consent of the above properties is provided in the application form.

Table B: Transmission Line Technical Details

Component	Description/Dimensions
Height of pylons	Maximum of 30 m high
Length of transmission line	Route 1 (Preferred Alternative): Approximately 23 km Route 2 (Alternative) : Part 1 approximately 5 km Part 2 approximately 25 km
Type of poles used	Steel monopole or steel lattice tower structures
Corridor within which to construct the transmission line	200 m corridor (i.e., 100 m on either side of the proposed transmission lines)
Area occupied by pylon servitude	The pylon servitude width will be between 31 m (132 kV) and 55 m (400 kV) wide
Transmission capacity	Up to 400 kV
Area occupied by both permanent and construction laydown areas	Approximately 1 Hectare (ha)
Area occupied by O&M buildings	Approximately 1 Hectare (ha)
Length of service road	Approximately 40 km
Width of service road	Approximately 5 m
Height of fencing	No fencing for Transmission Lines
Type of fencing	No fencing for Transmission Lines

Table C: Switching Station Technical Details

Component	Description / Dimensions
Area occupied by switching station	Maximum 100 m x 100 m footprint
Capacity of switching station	Up to 400 kV
Area occupied by both permanent and construction laydown areas	Approximately 2.8 ha (i.e., ~200 m x 140 m)
Area occupied by buildings	Approximately 2.8 ha (i.e., ~200 m x 140 m)

Table D: Preferred Alternative Proposed Transmission Line Route Coordinates - Start, Middle and End and Switching Station Centre Point

Geographical Co-ordinates		Route 1 (Alternative 1 – The Preferred Alternative)	Switching Station (Centre Point)
Start	Longitude	30° 42.951' S	30° 35.440' S
	Latitude	24° 5.632' E	24° 16.864' E
Middle	Longitude	30° 39.050' S	
	Latitude	24° 11.165' E	
End	Longitude	30° 35.385' S	
	Latitude	24° 16.857' E	

See Figure i for the proposed geographical co-ordinates of the proposed development.

Table E: Details of the Applicant

Name of the Applicant:	Mulilo De Aar 2 South (Pty) Ltd		
Name of contact person for applicant (if other):	Constantin Hatzilambros		
Company/ Trading name (if any):	Mulilo De Aar 2 South (Pty) Ltd		
Company Registration Number:	2012/041424/07		
BBBEE status:	Level 4		
Physical address:	Top Floor Golf Park 4, Raapenberg Rd, Mowbray		
Postal address:	PO Box 548 Howard Place		
Postal code:	7450	Cell:	-
Telephone:	0216853240	Fax:	-
E-mail:	constantin@mulilo.com		

Table F: Details of the Environmental Assessment Practitioner

Name of the EAP organisation:	Arcus Consultancy Services South Africa (Pty) Ltd		
Person who compiled this Report:	Ashlin Bodasing		
Contact Person (if not author):	Ashlin Bodasing		
Postal address:	Office 607, Cube Work Space, 24 Hans Strijdom Avenue, Cape Town		
Telephone:	(021) 412 1529	Postal Code:	8001
Cellular:	0763408914	Fax:	(-) -
E-mail:	ashlinb@arcusconsulting.co.za / deaar@arcusconsulting.co.za		

EAP Qualifications:	Bachelor of Social Science: Geography and Environmental Management EAPASA 2020/780
Details of Lead EAP Expertise	Ashlin Bodasing is the Technical Director at Arcus, located in Cape Town. Having obtained her Bachelor of Social Science Degree from the University of Kwa-Zulu Natal; she has over 15 years' experience in the environmental consulting industry in southern Africa. She has gained extensive experience in the field of Integrated Environmental Management, environmental impact assessments and public participation. She has also been actively involved in a number of industrial and infrastructural projects, including electricity power lines and substations; road and water infrastructure upgrades and the installation of telecommunication equipment and as well green field coal mines, as well as renewable energy facilities, both wind and solar. Ashlin has major project experience in the development of Environmental Impact Assessments, Basic Assessments, Environmental Management Plans and the monitoring of construction activities. Her areas of expertise include project management, environmental scoping and impact assessments, environmental management plans, environmental compliance monitoring and environmental feasibility studies. Experience also includes International Finance Corporation Performance Standards and World Bank Environmental Guidelines environmental reviews. She has worked in Mozambique, Botswana, Lesotho and Zimbabwe.

Please See Appendix A for EAP Declaration of Independence and Curriculum Vitae (CV).

Table G: BA Project Team

Name	Organisation	Role
Aneesah Alwie	Arcus	EAP Assistant
Dr Owen Davies	Arcus	Bird Impact Assessment
Jon Smallie	Independent	External Review of Bird Impact Assessment
Dr Owen Davies	Arcus	Terrestrial Ecological Impact Assessment (Flora and Fauna)
Simon Todd	3Foxes Consulting	External Review of Ecology Impact Assessment
Dr Brian Colloty	Enviro Sci (Pty) Ltd	Freshwater and Wetlands Impact Assessment
Johann Lanz	Independent	Geology, Soils and Agriculture Impact Assessment
John Gribble	ACO Associates	Heritage and Archaeological Impact Assessment

Please see Volume II of this Basic Assessment Report (BAR) for the specialist impact assessment reports produced for this development.

Table H: DEFF Applicable Listed Activities

LISTING NOTICE	ACTIVITIES
LN 1 GN R327 ²	11; 12; 14; 19; 24(ii); 27(i); 28(ii); 48 and 56.
LN 2 GN 325 ³	9
LN 3 GN R324 ⁴	4(g)(ii)(bb)(ee); 10 (g)(ii)(ee); 12(g)(i); 14(ii)(a)(c)(g)(ii)(bb)(ff); 18 (g)(bb)(ee) and 23(a)(c)(g)(i)(bb)(ee).

² "Listing Notice 1 of the EIA Regulations, promulgated under Government Notice R983 of 4 December 2014, as amended by Government Notice R327 of 7 April 2017."

³ "Listing Notice 2 of the EIA Regulations, promulgated under Government Notice R983 of 4 December 2014, as amended by Government Notice R325 of 7 April 2017."

⁴ "Listing Notice 3 of the EIA Regulations, promulgated under Government Notice R985 of 4 December 2014, as amended by Government Notice R324 of 7 April 2017."

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
Summary of Findings.....	ii
Summary of Construction Phase Impacts.....	v
Summary of Operational Phase Impacts	viii
Summary of Decommission Phase Impacts	x
Summary of Cumulative Phase Impacts	xi
DEFF: Information Requirements for Transmission Lines and Associated Infrastructure Applications	xii
 1 INTRODUCTION	 1
1.1 Purpose and Structure of this Report.....	1
1.2 Overview of the BA Process	2
1.3 Assumptions and Limitations	4
 2 ENVIRONMENTAL LEGAL FRAMEWORK	 4
2.1 The National Environment Management Act, 1998 (Act 107 of 1998)	4
2.2 The National Heritage Resources Act, 1999 (Act No 25 of 1999)	8
2.3 Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)	9
2.4 Conservation of Agricultural Resources, 1983 (Act No. 43 of 1983)	9
2.5 National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)	9
2.6 The Environment Conservation Act, 1989 (Act No.73 of 1989), the National Noise Control Regulations: GN R154 of 1992	9
2.7 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	10
2.8 National Water Act, 1998 (Act No. 36 of 1998)	10
2.9 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	11
2.10 National Forests Act (Act No. 84 of 1998)	11
2.11 The Nature and Environmental Conservation Ordinance No. 19 of 1974; and Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009)	11
2.12 Astronomy Geographic Advantage Act, 2007 (Act. 21 of 2007)	11
2.13 Additional Relevant Legislation.....	12
2.14 Conventions and Treaties.....	12
2.15 Policies and Guidelines.....	13
 3 METHODOLOGY	 14
3.1 NEMA Requirements.....	14
3.2 Environmental Screening Tool	17
3.3 Specialist Methodology	23
3.4 Identification of Potential Impacts	24

3.5	Cumulative Impact Assessment	27
4	PUBLIC PARTICIPATION PROCESS	29
5	BASELINE ENVIRONMENT	30
5.1	Regional and Local Context.....	30
5.2	Climatic Conditions.....	31
5.3	Biophysical Characteristics	31
5.4	Ecological Characteristics.....	33
5.5	Avifaunal Characteristics.....	34
5.6	Rivers, Watercourses and National Freshwater Ecosystems Priority Areas	37
5.7	Heritage and Cultural Landscape	37
5.8	Social Context	38
6	NEED AND DESIRABILITY	39
7	ASSESSMENT OF ALTERNATIVES	41
7.1	Legislative Requirements.....	41
7.2	Route Alternatives.....	42
7.3	Location and Layout Alternatives.....	43
7.4	Grid Connection Technology Alternatives	43
7.5	The No Development Alternative	45
7.6	Summary of Alternatives Considered	45
8	DESCRIPTION OF THE PREFERRED ALTERNATIVE	46
9	ASSESSMENT OF POTENTIAL IMPACTS.....	47
9.1	Soil.....	47
9.2	Aquatic	48
9.3	Terrestrial Ecology	51
9.4	Avifauna	58
9.5	Heritage, Archaeology and Palaeontology	62
9.6	Visual	64
9.7	Social	65
9.8	Traffic	68
10	ASSESSMENT OF CUMULATIVE IMPACTS.....	70
10.1	Soil.....	70
10.2	Aquatic	70
10.3	Terrestrial Ecology	71
10.4	Avifauna	72
10.5	Heritage, Archaeology and Palaeontology	73

10.6	Visual	73
10.7	Social	73
10.8	Traffic	74
11	SUMMARY OF FINDINGS AND RECOMMENDATIONS.....	74
11.1	Geology, Soil and Agriculture	74
11.2	Freshwater and Wetlands	75
11.3	Flora and Terrestrial Fauna	76
11.4	Avifauna	77
11.5	Cultural Heritage, Archaeology and Palaeontology	77
12	CONDITIONS TO BE INCLUDED IN THE ENVIRONMENTAL AUTHORISATION.....	78
13	IMPACT STATEMENT AND CONCLUSION.....	80

APPENDIX A: EAP DECLARATION OF INDEPENDENCE AND CV

APPENDIX B: GENERIC EMPRS FOR ELECTRICAL INFRASTRUCTURE

APPENDIX C: PUBLIC PARTICIPATION REPORT

FIGURE LIST

Figure i	: Proposed Development Geographical Co-ordinates
Figure 1.1	: Site Location
Figure 3.1	: Renewable Energy Projects within 35 km radius
Figure 5.1	: Land Use and Land Cover
Figure 5.2	: Critical Biodiversity Areas
Figure 8.1	: Proposed Development Plan
Figure 11.1	: Environmental Sensitivity Map
Figure 11.1a	: Environmental Sensitivity Map (zoomed in)
Figure 11.1b	: Environmental Sensitivity Map (zoomed in)
Figure 11.1c	: Environmental Sensitivity Map (zoomed in)
Figure 11.1d	: Environmental Sensitivity Map (zoomed in)

PLATE LIST

Plate 7.1	: Concrete or steel monopoles
Plate 7.2	: Guy line supported steel structures
Plate 7.3	: Freestanding metal lattice towers
Plate 7.4	: Multi-pole structures such as H-towers or K-towers

1 INTRODUCTION

Mulilo De Aar 2 South (Pty) Ltd ('Mulilo') appointed Arcus Consultancy Services South Africa (Pty) Ltd ('Arcus') to act as project manager to undertake this basic assessment process for environmental authorisation for the proposed development.

Mulilo is applying for environmental authorisation of an up to 400 kV transmission line and a switching station (the proposed development). The proposed development site is located within the Electricity Grid Infrastructure Central Strategic Transmission Corridor as per Government Notice 113, National Environmental Management Act, 1998, (Act No. 107 of 1998)⁵. Therefore, a Basic Assessment (BA) process contemplated in Regulation 19 and 20 of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, is being followed to obtain environmental authorisation. Mulilo requires authorisation of the transmission line, for up to 400 kV, and the switching station. Although the applicant considered two alternatives, it is requested that Alternative 1, the Preferred Alternative be authorised⁶.

The proposed development aims to connect the authorised De Aar 2 South Wind Energy Facility ('DA2S WEF') (DEFF Ref. No.: 12/12/20/2463/1/AM7) to the existing Eskom Hydra Substation.

The proposed development is located approximately 15 to 26 km east of the town of De Aar and falls within the Emthanjeni Local Municipality and Pixley ka Seme District Municipality of the Northern Cape Province. The most significant road within the area is the N10 and the proposed development is located between 2 km and 25 km from this national road (Figure 1.1: Site Location).

The Applicant details is included in Table E above, and the EAP details is included in Table F above and Appendix A of this report.

1.1 Purpose and Structure of this Report

This BA report aims to provide the following information for the competent authority to make an informed decision on the application:

- Policy and legislative context of the proposed development;
- Methodology used to conduct the assessment and derive an outcome;
- The public participation process;
- The baseline environmental conditions including any specialists' studies conducted;
- The need and desirability;
- The assessment of alternatives; and
- The results of the impact assessment.

The BA Report is set out in two volumes:

Volume I: BA Report; and

Volume II: Specialist Reports.

Table 1.1: Structure of this Report

5

https://www.environment.gov.za/sites/default/files/gazetted_notices/Nema107of1998_electricitygridinfrastructuredevelopmentactivities_n113.pdf

⁶ This route has also been pre-negotiated and agreed upon with all landowners.

Section	Title	Containing
1	Introduction	Purpose and Structure of the BA Report, Overview of the BA process, and the Assumptions and Limitations of the study.
2	Environmental Legal Framework	National Environmental Legislation, International Conventions and Treaties, Policies and Guidelines.
3	Methodology	NEMA Requirements, DEFF Screening Tool, Specialists Studies Methodology, Assessment Techniques for the BA.
4	Public Participation Process	Initial Notification, BA Phase Public Participation Process, Summary of Issues.
5	Description of the Baseline Environment	A description of the Affected Environment.
6	Need and Desirability	Description of the Need and Desirability of the Proposed Development.
7	Assessment of Alternatives	Route, Location and Layout, Grid Connection, and No-Go Alternatives.
8	The Preferred Alternative	Description of the Proposed Development.
9	Assessment of Potential Impacts	A Detailed Assessment of the Potential Impacts During the Construction, Operational and Decommissioning Phases.
10	Assessment of Cumulative Impacts	A Detailed Assessment of the Potential Cumulative Impacts.
11	Summary of Findings and Recommendations	A summary of the Findings and Recommendations of the Impact Assessment.
12	Conditions to be included in the EA	Conditions to be included in the EA.
13	Impact Statement and Conclusion	Conclusion of the assessment.
Appendix A	EAP Declaration of Independence and CV	Commissioner of Oaths EAP Declaration of Independence and CV of the EAP.
Appendix B	Environmental Management Programme	Generic EMPr for Grid Infrastructure and Generic EMPr for substation and associated infrastructure.
Appendix C	Public Participation Report	Public Participation Processes to date.

1.2 Overview of the BA Process

The application for environmental authorisation and assessment of impacts is ultimately a decision-making process with the specific aim of selecting an option that is technically feasible, practical, and will cause the least impact to the environment. The BA process identifies activities which may have a detrimental effect on the environment, and which would therefore require Environmental Authorisation prior to commencement.

The proposed development site is located within the Electricity Grid Infrastructure Central Strategic Transmission Corridor as per Government Notice 113, National Environmental

Management Act, 1998, (Act No. 107 of 1998)⁷. Therefore, a Basic Assessment (BA) process contemplated in Regulation 19 and 20 of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, is being followed to obtain environmental authorisation and the **timeframe for decision-making is 57 days**.

The independent environmental assessment practitioner (EAP) and various specialists identified potential negative and positive impacts that could arise as a result of the proposed development. Mitigation measures were also recommended which would allow for the avoidance or reduction of negative impacts or which may enhance positive impacts. The appointment of specialists was made based on the List of Specialists identified by the Screening Report generated for the proposed development on the DEFF Screening Tool. The Screening Report generated is submitted to the DEFF as an appendix in the application form.

The key phases of this BA process are described below:

- **Pre-Application Process:** The DEFF is consulted during a pre-application meeting to confirm the process which will be followed, including discussions based on the results of the Screening Tool, appointment of specialists, and the Public Participation Process which will be followed.
- **Initial Notification and Call to Register as I&APs through the following:** Placement of advertisements, site notices, posters and notification e-mails. The aim of this step is to inform potential interested and affected parties of the proposed activity and to encourage initial comment and feedback.
- **Basic Assessment Process: Collation of initial comments and specialist investigations into a concise report (this document) which provides feedback on the following:**
 - Nature of the activity;
 - Methodology used to conduct the assessment and derive an outcome;
 - The public participation process;
 - The baseline environmental conditions including any specialists' studies conducted;
 - The need and desirability;
 - Identification of potential feasible alternatives;
 - Identification of potential positive and negative impacts; and
 - Identification of knowledge gaps.

The identified impacts have been assessed and any specific management and mitigation measures have been included in the Generic Environmental Management Programmes (EMPr) (Appendix B). The findings are included in this Report.

- **Ongoing Public Consultation:** Interested and Affected Parties (I&APs) are consulted on an on-going basis throughout the BA Process. This involvement was initiated through the dissemination of information by means of advertisements, notification letters, posters and site notices. Opportunities are provided for I&APs to review the Draft Basic Assessment Report.

Following the completion of the relevant processes described above and the submission of documentation to the competent authority (DEFF), the DEFF will review the application and

7

https://www.environment.gov.za/sites/default/files/gazetted_notices/Nema107of1998_electricitygridinfrastructuredevelopment_activities_n113.pdf

issue a decision on whether to grant the applicant Environmental Authorisation or not. I&APs will be informed of the decision and their rights to appeal.

1.3 Assumptions and Limitations

The following assumptions and limitations are applicable:

- The assumption is made that the information on which this report is based (baseline studies and project information, as well as existing information) is accurate and correct.
- It is assumed that the information contained in the Screening Report generated is accurate and correct and valid at the time of preparing this report.
- It should be emphasised that information, as presented in this report, only has reference to the study area as indicated on the accompanying figures. Therefore, this information cannot be applied to any other area without detailed investigation.
- The assumptions and limitations, presented in each specialist report, Volume II of this report, are noted for the BA Report.
- It is assumed that the corridors investigated and assessed for the proposed routes is technically suitable for such development.
- It is assumed that the connection to the national grid via the existing Eskom Hydra Substation is technically adequate, feasible and viable.
- The developments to be included in the cumulative assessment is based on available public information, the most current DEFF database of renewable applications (at the time of writing the report, REEA_OR_2020_Q4.shp⁸), and if the applicant has submitted an application for environmental authorisation.
- It is assumed that the recommendations derived from this study would be included in all tender documentation and the EMP for implementation.

2 ENVIRONMENTAL LEGAL FRAMEWORK

2.1 The National Environment Management Act, 1998 (Act 107 of 1998)

Section 2 of the National Environment Management Act, 1998 (NEMA) as amended, lists environmental principles that are to be applied by all organs of state regarding proposals that may significantly affect the environment. Included amongst the key principles is the principle that all development must be socially, economically and environmentally sustainable, environmental management must place people and their needs at the forefront of its concern, to serve their physical, psychological, developmental, cultural and social interests equitably.

NEMA also provides for the participation of I&APs and it stipulates that decisions must take the interests, needs and values of all I&APs into account.

Chapter 5 of NEMA outlines the general objectives and implementation of Integrated Environmental Management (IEM), the latter providing a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for the granting of environmental authorisations.

To give effect to the general objectives of IEM, the potential impacts on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority. Section 24(4) outlines the minimum requirements for procedures for the investigation, assessment and communication of the potential impact of activities.

The EIA Regulations 2014 as amended by GNR 326 of 2017 provide for the control of certain Listed Activities. These activities are listed in Government Notice No. R327 (Listing

⁸ South African Renewable Energy EIA Application Database (<http://egis.environment.gov.za/frontpage.aspx?m=27>)

Notice 1 – Basic Assessment), R325 (Listing Notice 2 – Scoping & EIA Process) and R324 (Listing Notice 3 – Basic Assessment) of 7 April 2017, and are prohibited to commence until environmental authorisation has been obtained from the competent authority, in this case, the DEFF.

The DEFF is the competent authority for all renewable energy proposals, as NEMA states that:

"24C. (2) The Minister must be identified as the competent authority in terms of subsection (1) if the activity- (a) has implications for international environmental commitments or Relations"

This project will be related to and have a connection with activities which has implications for international environmental commitments that South Africa has made in terms of climate change.

In terms of GN 350, 13 April 2017 of NEMA, 1998 (Act 107 of 1998), the proposed development falls within the Central Strategic Transmission Corridor. The basic assessment procedure contemplated in Regulation 19 and 20 of the EIA Regulations, 2014 to obtain environmental authorisation, as required in terms of the Act is being followed. The timeframe for decision-making as contained in the EIA Regulations, 2014 for purposes of this application for EA, as contemplated in GN 350 of NEMA (Act No. 107 of 1998) is 57 days.

The Listed Activities applicable to this proposed project are presented in Table 2.1 below. All potential impacts associated with these Listed Activities has been considered and adequately assessed in this BA Report.

Table 2.1: NEMA Listed Activities in Relation to the Proposed Development which falls within the Central Strategic Infrastructure Corridor

Listing Notices 1, 2 and 3 07 April 2017	Listed Activity	Description of project activity that triggers listed activity
Listing Notice 1 GN R 327 Activity 11	<i>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</i>	Authorisation is required for up to 400 kV transmission lines, but the distribution of electricity from this proposed project may be less than 275 kV.
Listing Notice 1 GN R 327 Activity 12	<i>The development of- (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs (a) within a watercourse; (c) if no development setback exists within 32 m of a watercourse, measured from the edge of a watercourse.</i>	Infrastructure such as roads is proposed within 32 m of a watercourse. The cumulative footprint of all proposed development within 32 m of a watercourse may exceed 100 square metres.
Listing Notice 1 GN R 327 Activity 14	<i>The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</i>	The proposed switching station is likely to require the use of transformer oils/other hazardous substances during the operational phase.
Listing Notice 1 GN R 327	<i>The infilling or depositing of any material of more than 10 cubic metres into or the dredging, excavation, removal or moving</i>	The construction of the transmission lines will traverse watercourses. The construction will require the infilling or

Listing Notices 1, 2 and 3 07 April 2017	Listed Activity	Description of project activity that triggers listed activity
Activity 19	<i>of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse.</i>	depositing of more than 10 cubic meters or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse.
Listing Notice 1 GN R 327 Activity 24	<i>The development of a road (ii) with a road reserve wider than 13,5 meters or where no reserve exists where the road is wider than 8 meters</i>	The construction of the transmission lines will require roads wider than 8 meters.
Listing Notice 1 GN R 327 Activity 27	<i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation for (i) the undertaking of a linear activity</i>	The development of the switching station and the infrastructure associated with the transmission lines, that is non-linear i.e., could require clearing of more than 1 hectare of indigenous vegetation but less than 20 hectares.
Listing Notice 1 GN R 327 Activity 28	<i>Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</i>	Construction of the proposed development will change the land use from agriculture to mixed - agriculture and electricity transmission. The proposed development is outside an urban area and has a footprint that will exceed 1 ha.
Listing Notice 1 GN R 327 Activity 48	<i>The expansion of- Infrastructure or structures where the physical footprint is expanded by 100 square metres or more; where such expansion occurs- (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</i>	Existing infrastructure such as roads and bridges within 32 m of a watercourse may require expansion. The cumulative footprint of all proposed development expansion within 32 m of a watercourse may exceed 100 square metres.
Listing Notice 1 GN R 327 Activity 56	<i>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13.5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.</i>	Existing farm access roads may need to be widened or lengthened. These roads may have no road reserve and may be wider than 8 m in some parts of it.
Listing Notice 2 GN R 325 Activity 9	<i>The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex</i>	Authorisation is required for an up to 400 kV transmission line to connect to the national grid and / or various battery energy storage systems at approved solar projects.
Listing Notice 3 GN R 324 Activity 4	<i>The development of a road wider than 4 metres with a reserve less than 13,5 metres (g) Northern Cape</i>	Internal and external access roads will be constructed, which are wider than 4 m. The site falls outside of an urban area and part of it falls within a CBA 1 and CBA 2.

Listing Notices 1, 2 and 3 07 April 2017	Listed Activity	Description of project activity that triggers listed activity
	<p><i>(ii) Areas outside urban areas;</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p>	
Listing Notice 3 GN R324 Activity 10	<p><i>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</i> <i>(g) Northern Cape</i> <i>(ii) Outside urban areas:</i> <i>(ee) Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p>	The proposed switching station is likely to require the use of transformer oils/other hazardous substances during the operational phase.
Listing Notice 3 GN R324 Activity 12	<p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i> <i>(g) Northern Cape</i> <i>(i) All areas outside of urban areas;</i></p>	The proposed development may require the clearance of natural vegetation in excess of 300 m ² in areas of natural vegetation. Parts of the site fall within CBA 1 and CBA 2.
Listing Notice 3 GN R324 Activity 14	<p><i>The development of –</i> <i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i> <i>where such development occurs—</i> <i>(a) within a watercourse;</i> <i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</i> <i>(g) Northern Cape</i> <i>ii. Outside urban areas:</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i></p>	Infrastructure associated with the transmission lines will be constructed within 32 m of a watercourse. The proposed site lies outside of an urban area and the transmission lines traverses ESAs and CBAs.
Listing Notice 3 GN R324	<i>The widening of a road by more than 4 metres or the lengthening of a road by more than 1 kilometre</i>	Existing roads will be widened or lengthened within ESAs and CBAs, during

Listing Notices 1, 2 and 3 07 April 2017	Listed Activity	Description of project activity that triggers listed activity
Activity 18	<i>(g) Northern Cape (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</i>	construction of the access and servitude roads.
Listing Notice 3 GN R324 Activity 23	<i>The expansion of— (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; (g) Northern Cape i. Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i>	The construction of the transmission lines will include the expansion of existing infrastructure such as roads that are located within 32 m of a watercourse, ESAs and CBAs.

2.2 The National Heritage Resources Act, 1999 (Act No 25 of 1999)

Section 38 (1) of the National Heritage Resources Act, 1999 (NHRA) lists development activities that would require authorisation by the responsible heritage resources authority. Activities considered applicable to the proposed project include the following:

*“(a) The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
(c) any development or other activity which will change the character of a site; and
(i) exceeding 5000 m² in extent.”*

The NHRA, 1999, requires that a person intending to undertake such an activity must notify the relevant national and provincial heritage authorities at the earliest stages of initiating such a development. The relevant heritage authority would then in turn, notify the person whether a Heritage Impact Assessment Report should be submitted. According to Section 38(8) of the NHRA, 1999, a separate report would not be necessary if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (No. 73 of 1989) (ECA) (now replaced by NEMA, Act 107 of 1998) or any other applicable legislation. The decision-making authority must ensure that the heritage evaluation fulfils the requirements of the NHRA, 1999, and take into account any comments and recommendations made by the relevant heritage resources authority.

A draft BA Report (Arcus, September 2020) was subjected to a 30 day comment period from the 17 October 2020 to the 19 November 2020 (both days inclusive). During the public comment period, the application process was suspended, however, a comment of no objection was received from SAHRA.

The Heritage Impact Assessment, which forms part of this Basic Assessment process will be submitted again to SAHRA for comment.

In South Africa, the law is directed towards the protection of human-made heritage, although places and objects of scientific importance are covered. The NHRA, 1999, also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. While not specifically mentioned in the NHRA, Scenic Routes are recognised as a category of heritage resources which requires grading as the Act protects area of aesthetic significance.

2.3 Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)

In terms of the Subdivision of Agricultural Land Act, 1970, any application for change of land use must be approved by the Minister of Agriculture.

2.4 Conservation of Agricultural Resources, 1983 (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA), 1983, states that no degradation of natural land is permitted. The Act requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilization of marshes, water sponges and watercourses are also addressed.

2.5 National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)

The purpose of the National Veld and Forest Fire Act, as amended by the National Fire Laws Amendment Act (Act 12 of 2001), is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act applies to the open countryside beyond the urban limit and puts in place a range of requirements. It also specifies the responsibilities of land owners. The term 'owners' includes lessees, people in control of land, the executive body of a community, the manager of State land, and the chief executive officer of any local authority. The requirements include, but are not limited to, the maintenance of firebreaks and availability of firefighting equipment to reasonably prevent the spread of fires to neighbouring properties.

2.6 The Environment Conservation Act, 1989 (Act No.73 of 1989), the National Noise Control Regulations: GN R154 of 1992

The Environment Conservation Act, 1989 (ECA) allows the Minister of Environmental Affairs and Tourism (now the "Minister of Environmental Affairs") to make regulations regarding noise, amongst other concerns. The Minister has made noise control regulations under the ECA.

In terms of section 25 of the ECA, the national noise-control regulations (NCR) were promulgated (GN R154 in *Government Gazette* No. 13717 dated 10 January 1992). The NCRs were revised under Government Notice Number R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.

Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996 legislative responsibility for administering the NCR was devolved to provincial and local authorities.

These regulations define "**disturbing noise**" as:

"Noise level which exceeds the zone sound level or, if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more".

These Regulations prohibits anyone from causing a disturbing noise.

2.7 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

Section 34 of the Air Quality Act, 2004 (AQA) makes provision for:

- (1) The Minister to prescribe essential national noise standards -
 - (a) For the control of noise, either in general or by specified machinery or activities or in specified places or areas; or
 - (b) For determining –
 - (i) a definition of noise; and
 - (ii) The maximum levels of noise.
- (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.

This section of the Act is in force, but no such standards have yet been promulgated.

An atmospheric emission license issued in terms of Section 22 may contain conditions in respect of noise. This however will not be relevant to this proposed development.

2.7.1 National Dust Control Regulations, 2013

The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004), makes provision for national dust control regulations. These regulations prescribe dust fall standards for residential and non-residential areas. These Regulations also provide for dust monitoring, control and reporting.

The acceptable dust fall rates are:

Restriction Area	Dust Fall (D) (mg/m ² /day, 30 day average)	Permitted Frequency of exceedance
Residential	D<600	Two within a year, not sequential months
Non- Residential	600 <D< 1200	Two within a year, not sequential months

2.8 National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998 (NWA) provides for constitutional requirements including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State.

A water resource includes any watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse is interpreted as a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse.

Relevant water uses, such as a borehole or extraction of water from water resources, for the proposed construction of the proposed project and associated infrastructure, which will require access roads over watercourses and drainage channels, in terms of Section 21 of the Act include, but are not limited to, the following:

Section 21(c): Impeding or diverting the flow of water in a watercourse; and
Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.

GN 1199 of 18 December 2009 grants general authorisation (GA) for the above water uses based on certain conditions. It also stipulates that these water uses must be registered with the responsible authority.

Pollution of river water is a contravention of the NWA. Chapter 3, Part 4 of the NWA deals with pollution prevention and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

Chapter 3, Part 5 of the NWA deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. The responsibility for remedying the situation rests with the person responsible for the incident or the substance involved.

2.8.1 Permit Requirements

A Water Use License Application (WULA) or a General Application (GA) may be required. This will be determined by the Department of Human Settlements, Water and Sanitation (DHSWS) during the WULA pre-application process. The required permitting has been submitted to the DHSWS. Proof of the application process will be provided in the Final BAR, if available.

2.9 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

2.9.1 Threatened or Protected Species List, 2015

Amendments to the Threatened or Protected Species (TOPS) list were published on 31 March 2015 in Government Gazette No. 38600 and Notice 256 of 2015. Certain species that occur on the site may be threatened or protected.

2.9.2 Alien and Invasive Species Regulations, 2016

The Act and Regulations set out various degrees of Invasive species (Plants, Insects, Birds, Animals, Fish and Water Plants) and requires that certain of those invasive species are documented and, in some cases, removed from properties in South Africa.

The Regulations list 4 categories of invasive species that must be managed, controlled or eradicated from areas where they may cause harm to the environment, or that are prohibited to be brought into South Africa.

2.10 National Forests Act (Act No. 84 of 1998)

This act lists protected tree species and prohibits certain activities. The prohibitions provide that *"no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister"*.

2.11 The Nature and Environmental Conservation Ordinance No. 19 of 1974; and Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009)

These were developed to protect both animal and plant species within the various provinces of the country which warrant protection. These may be species which are under threat or which are already considered to be endangered and species are listed in the relevant documents. The provincial environmental authorities are responsible for the issuing of permits in terms of this legislation.

2.12 Astronomy Geographic Advantage Act, 2007 (Act. 21 of 2007)

The Act provides for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy. The Square Kilometer Array radio telescope

is located in the declared Karoo Central Advantage Array and as such it is protected against harmful interference from wireless communication and electromagnetic emissions from electrical equipment.

2.13 Additional Relevant Legislation

The applicant must also comply with the provisions of other relevant national legislation. Additional relevant legislation that has informed the scope and content of this BA Report includes the following:

- *Constitution of the Republic of South Africa, 1996 (Act No. 108, 1996);*
- *Aviation Act, 1962 (Act No. 74, 1962);*
- *National Environmental Management: Waste Act, 2008 (Act No. 59, 2008);*
- *National Environmental Management: Protected Areas Act, 2003 (Act No. 57, 2003);*
- *National Roads Act, 1998 (Act No. 7, 1998)*
- *Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);*
- *Fertiliser, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947);*
- *Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); and*
- *Independent Communications Authority of South Africa Act, 2000 (Act No. 13 of 2000; as amended).*
- *Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended.*

2.14 Conventions and Treaties

2.14.1 The Convention on Biological Diversity (CBD) (1993)

This is a multilateral treaty for the international conservation of biodiversity, the sustainable use of its components and fair and equitable sharing of benefits arising from natural resources. Signatories have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. South Africa became a signatory to the CBD in 1993, which was ratified in 1995.

The convention prescribes that signatories identify components of biological diversity important for conservation and monitor these components in light of any activities that have been identified which are likely to have adverse impacts on biodiversity. The CBD is based on the precautionary principle which states that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat and that in the absence of scientific consensus the burden of proof that the action or policy is not harmful falls on those proposing or taking the action.

2.14.2 The Ramsar Convention (1971)

The Convention on Wetlands, called the Ramsar Convention, as it was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975, is an intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. Under the three pillars of the convention the Contracting Parties commit to work towards the wise use of all their wetlands through national plans, policies and legislation, management actions and public education; designate suitable wetlands for their list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management; and Cooperate internationally on transboundary wetlands, shared wetland systems, shared species, and development projects that may affect wetlands.

2.14.3 The Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention) (1983)

An intergovernmental treaty, concluded under the sponsorship of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a global scale. The fundamental principles listed in Article II of this treaty state that signatories acknowledge the importance of migratory species being conserved and agree to take action to this end "*whenever possible and appropriate*", "*paying special attention to migratory species the conservation status of which is unfavourable and taking individually or in cooperation appropriate and necessary steps to conserve such species and their habitat*".

2.14.4 The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) (1999)

An intergovernmental treaty developed under the framework of the Convention on Migratory Species (CMS), concerned with the coordinated conservation and management of migratory waterbirds throughout their entire migratory range. Signatories of the Agreement have expressed their commitment to work towards the conservation and sustainable management of migratory waterbirds, paying special attention to endangered species as well as to those with an unfavourable conservation status. The assessment of the ecology and identification of sites and habitats for migratory waterbirds is required to coordinate efforts that ensure that networks of suitable habitats are maintained and investigate problems likely posed by human activities.

2.15 Policies and Guidelines

2.15.1 Environmental Impact Assessment Guidelines

Relevant guidelines and policies as applicable to the management of the EIA process and to this application have also been taken into account, as indicated below:

- *IEM Guideline Series (Series 3): Stakeholder engagement (2002);*
- *IEM Guideline Series (Series 4): Specialist studies (2002);*
- *IEM Guideline Series (Series 5): Impact Significance (2002);*
- *IEM Guideline Series (Guideline 5): Companion to the EIA Regulations 2010 (October 2012);*
- *IEM Guideline Series (Series 7): Cumulative Effects Assessment (2002);*
- *IEM Guideline Series (Guideline 7): Public Participation in the EIA process (October 2012);*
- *IEM Guideline Series (Series 7): Alternatives in the EIA process (2002);*
- *IEM Guideline Series (Guideline 9): Draft guideline on need and desirability in terms of the EIA Regulations 2010 (October 2012);*
- *DEFF (2017) Guideline on Need and Desirability, Department of Environment, Forestry and Fisheries (DEFF) Pretoria, South Africa (2017);*
- *IEM Guideline Series (Series 12): Environmental Management Plans (EMP) (2002); and*
- *IEM Guideline Series (Series 15): Environmental impact reporting (2002).*

2.15.2 The Equator Principles (EPs) III, 2013

The principles applicable to the project are likely to include:

- *Principle 2: Environmental and Social Assessment;*
- *Principle 3: Applicable Environmental and Social Standards;*
- *Principle 4: Environmental and Social Management System and Equator Principles Action Plan;*
- *Principle 5: Stakeholder Engagement;*

- *Principle 6: Grievance Mechanism;*
- *Principle 7: Independent Review;*
- *Principle 8: Covenants;*
- *Principle 9: Independent Monitoring and Reporting; and*
- *Principle 10: Reporting and Transparency.*

These principles, among various requirements, include a requirement for an assessment process and an Environmental and Social Management Plan (ESMP) to be prepared by the client to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards, and the appointment of an independent environmental expert to verify monitoring information.

3 METHODOLOGY

The primary objective of the basic assessment (BA) process is to present sufficient information to the competent authority and interested and affected parties (I&APs) on predicted impacts and associated mitigation measures required to avoid or mitigate negative impacts, as well as to improve or maximise the benefits of the project.

3.1 NEMA Requirements

In terms of legal requirements, NEMA EIA Regulations 2014, as amended, regulate and prescribe the content of the BA Report and specify the type of supporting information that must accompany the submission of the report to the authorities. Table 3.1 shows how and where the legal requirements are addressed in this BA Report. Section 4 of this BA report provides a summary of the Public Participation Process (PPP) and Appendix C of this BA Report contains the Public Participation undertaken to date. As comments are received on the BA Report these will be collated and included in Appendix C of this BA Report.

As per the EIA Regulations 2014, as amended, *“the objective of the basic assessment process is to, through a consultative process-*

- 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 risk that need to be managed or monitored.*

The above activities are completed through consultation with:

- The lead authorities involved in the decision-making for the BA application (in this case, the DEFF);
- The I&APs, provincial and local governments, and other relevant organisations to ensure that local issues are well understood; and
- The specialist team to ensure that technical issues are identified.

The existing environment within which a proposed development is to be located is investigated through a review of relevant background literature and ground-truthing.

A primary objective is to present key stakeholders with the findings of the assessments, obtain and document feedback, and address all issues raised.

Table 3.1: Legislative Requirements for Scope of Assessment and Content of Basic Assessment Reports

Appendix 1 Requirements NEMA, 1998 (Act No. 107 of 1998)	Location in BAR
<i>A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-</i>	
<i>details of-</i>	
<i>(i) the EAP who prepared the report; and</i>	Executive Summary, Table F
<i>(ii) the expertise of the EAP, including a curriculum vitae;</i>	Appendix A
<i>the location of the activity, including-</i>	
<i>(i) the 21 digit Surveyor General code of each cadastral land parcel;</i>	Executive Summary, Table A
<i>(ii) where available, the physical address and farm name;</i>	
<i>(iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties;</i>	
<i>a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-</i>	
<i>(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</i>	Figure i Table D
<i>(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;</i>	
<i>a description of the scope of the proposed activity, including-</i>	
<i>(i) all listed and specified activities triggered and being applied for; and</i>	Table 2.1 Section 7
<i>(ii) a description of the activities to be undertaken including associated structures and infrastructure;</i>	
<i>a description of the policy and legislative context within which the development is proposed including-</i>	
<i>(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and</i>	Section 2 Section 6
<i>(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools framework, and instruments;</i>	
<i>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;</i>	Section 6
<i>a motivation for the preferred site, activity and technology alternative;</i>	Section 8

Appendix 1 Requirements NEMA, 1998 (Act No. 107 of 1998)	Location in BAR
<i>a full description of the process followed to reach the proposed preferred alternative within the site, including-</i>	Section 6
<i>(i) details of the alternatives considered;</i>	Section 4 Appendix C
<i>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</i>	Section 4 Appendix C
<i>(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</i>	Section 5
<i>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</i>	Section 9 Section 10
<i>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-</i> <i>(aa) can be reversed;</i> <i>(bb) may cause irreplaceable loss of resources; and</i> <i>(cc) can be avoided, managed or mitigated;</i>	Section 3.2 Volume II
<i>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</i>	Section 9 Section 10
<i>(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;</i>	Section 9 Section 10
<i>(viii) the possible mitigation measures that could be applied and level of residual risk;</i>	Section 7
<i>(ix) the outcome of the site selection matrix;</i>	Section 7
<i>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</i>	Section 7 Section 8
<i>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</i>	Section 3 Section 9
<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> <i>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</i> <i>(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;</i>	Section 9 Section 10
<i>an assessment of each identified potentially significant impact and risk, including-</i> <i>(i) cumulative impacts;</i> <i>(ii) the nature, significance and consequences of the impact and risk;</i> <i>(iii) the extent and duration of the impact and risk;</i> <i>(iv) the probability of the impact and risk occurring;</i> <i>(v) the degree to which the impact and risk can be reversed;</i> <i>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</i> <i>(vii) the degree to which the impact and risk can be avoided, managed or mitigated;</i>	Section 11 Volume II
<i>where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to</i>	

Appendix 1 Requirements NEMA, 1998 (Act No. 107 of 1998)	Location in BAR
<i>these Regulations and an indication as to how these findings and recommendations have been included in the final report;</i>	
<i>an environmental impact statement which contains-</i> (i) <i>a summary of the key findings of the environmental impact assessment;</i> (ii) <i>a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and</i> (iii) <i>a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</i>	Section 11 Figure 11.1 (a-d) and Figure 11.2 (a-c)
<i>based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management outcomes, and the impact management outcomes for the development for inclusion in the EMP;</i>	Section 9 Appendix B
<i>any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</i>	Section 11
<i>a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;</i>	Section 1.3
<i>a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;</i>	Section 11 Section 13
<i>where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;</i>	Commencement of construction will occur within 10 years of authorisation and conclude within 5 years of commencement. Post-construction monitoring requirements will be finalised within this period.
<i>an undertaking under oath or affirmation by the EAP in relation to-</i> (i) <i>the correctness of the information provided in the reports;</i> (ii) <i>the inclusion of comments and inputs from stakeholders and I&APs;</i> (iii) <i>the inclusion of inputs and recommendations from the specialist reports where relevant; and</i> (iv) <i>any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; and</i>	Appendix A
<i>where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;</i>	n/a
<i>any specific information that may be required by the competent authority; and</i>	n/a
<i>any other matters required in terms of section 24(4)(a) and (b) of the Act.</i>	n/a

3.2 Environmental Screening Tool

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16 (1)(b)(v) of the EIA Regulations, 2014 (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of BA

and EIA applications in terms of Regulation 19 and 21 of EIA Regulations, 2014 (as amended). The Screening Report generated for the proposed development is submitted to the DEFF as an appendix in the application form.

The screening report identified Solar PV / CSP Developments which received environmental authorisation within a 30km radius of the proposed development. No intersections with Environmental Management Frameworks (EMF) were found. In terms of development incentives, restrictions, exclusions or prohibitions, the site falls within the Strategic Transmission Corridor – specifically the Central Corridor.

Table 3.2 provides a summary of the specialist assessments identified by the screening report, and the response to each assessment in terms of the proposed development.

Table 3.2: Specialist assessments identified in terms of the national web-based screening tool for the proposed development

Identified Specialist Assessment	Assessment Protocol	Identified Sensitivity		Comment
		By DEFF Screening Report	By Specialist / EAP	
Agricultural Impact Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Agricultural Resources by Onshore Wind and/or Solar Photovoltaic Energy Generation Facilities where the Electricity Output is 20 MW or more, gazetted on 20 March 2020.	Medium Sensitivity	Medium Sensitivity	The classification of parts of the farm rated as medium agricultural sensitivity by the screening tool is disputed because the proposed site is on land which is unsuitable for cultivation due to both climate and soil limitations. The medium sensitivity areas should more accurately be classified as low agricultural sensitivity. Although the facility is for distribution and not generation of electricity, the criteria for reporting was still followed by the specialist. Refer to Chapter 9 – 12 as well as Volume II for the soil and agricultural impact assessment undertaken.
Landscape / Visual Impact Assessment	Landscape / Visual Theme had no environmental sensitivity in the screening report to base the required level of assessment on.	Not Determined	Low Sensitivity	The EAP assessed applicable impacts of the proposed development. Refer to Chapter 9 – 12.
Archaeological and Cultural Heritage Impact Assessment	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	High Sensitivity	High Sensitivity	On-site inspection confirms the high sensitivity rating. An archaeology and cultural heritage assessment have been undertaken. Refer to Chapter 9 – 12 as well as Volume II.
Palaeontology Impact Assessment	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	High Sensitivity	High Sensitivity	On-site inspection confirms the high sensitivity rating. A palaeontology assessment has been undertaken. Refer to Chapter 9 – 12 as well as Volume II.

Identified Specialist Assessment	Assessment Protocol	Identified Sensitivity		Comment
		By DEFF Screening Report	By Specialist / EAP	
Terrestrial Biodiversity Impact Assessment	Protocol for the Specialist Assessment and minimum report content requirements for Environmental Impacts on Terrestrial Biodiversity, gazetted on 20 March 2020. Note: This assessment was commissioned before the new regulations (October 2020) and thus follows regulations of March 2020.	Very High Sensitivity	Medium Sensitivity	Following the site verification, regulations make provision for linear activities such as the proposed development by stating that even the assessment and reporting requirements for areas identified as being of 'very high sensitivity' need not apply as impacts on terrestrial biodiversity are temporary in nature. The land disturbed by the power line development, can be returned to the current state within two years of the completion of the construction phase, and as such a Terrestrial Biodiversity Compliance Statement applies. An ecological impact assessment (including the assessment of plant and animal species) which assesses the biophysical environment of the proposed development has been conducted. Refer to Chapter 9 – 12 as well as Volume II.
Aquatic Biodiversity Impact Assessment	Protocol for the Specialist Assessment and minimum report content requirements for Environmental Impacts on Aquatic Biodiversity, gazetted on 20	Very High Sensitivity	Low Sensitivity	Following the site verification, the very high sensitivity is confirmed but the proposed corridor avoids these areas. To further assess the site sensitivity an aquatic impact assessment was produced for the proposed development. Refer to Chapter 9 – 121 as well as Volume II.
Avian Impact Assessment	Avian Theme had no environmental sensitivity in the screening report to base the required level of assessment on.	Not Determined	Low Sensitivity	The EAP appointed an avifaunal specialist to undertake an avifauna impact assessment for the proposed development. Refer to Chapter 9 – 12 as well as Volume II.

Identified Specialist Assessment	Assessment Protocol	Identified Sensitivity		Comment
		By DEFF Screening Report	By Specialist / EAP	
Civil Aviation Assessment	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Civil Aviation Installations, gazetted on 20 March 2020.	High Sensitivity	Low Sensitivity	Site verification analysis disputes the high sensitivity. The sensitivity should be reduced to low for the proposed development as there is no impact to the airspace of the proposed development area and immediate surrounds. The South African Civil Aviation Authority (CAA) has been and will continue to be consulted during the project to obtain comments from a civil aviation perspective (see Appendix C). Mulilo will also obtain the necessary CAA approvals (where necessary) once the design siting of the proposed development has been finalised. Initial comment has been provided by the EAP, refer to Volume II.
Defense Assessment	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Defence Installations, gazetted on 20 March 2020.	Low Sensitivity	Low Sensitivity	Site verification analysis confirms the low sensitivity. The sensitivity should be reduced to low for the proposed development as there is no impact to the airspace of the proposed development area and immediate surrounds. The South African Civil Aviation Authority (CAA) has been and will continue to be consulted during the project to obtain comments from a civil aviation perspective (see Appendix C). Mulilo will also obtain the necessary CAA approvals (where necessary) once the design siting of the proposed development has been finalised. Initial comment has been provided by the EAP, refer to Volume II.
RFI Assessment	RFI Theme had no environmental sensitivity in the screening report to base the required level of assessment on.	Not Determined	Not Determined	As no potential red flags for RFI exists within the development area and no sensitivity has been identified by the screening tool report. The EAP has not included this assessment as part of the application process.

Identified Specialist Assessment	Assessment Protocol	Identified Sensitivity		Comment
		By DEFF Screening Report	By Specialist / EAP	
Geotechnical Assessment	Geotechnical Theme had no environmental sensitivity in the screening report to base the required level of assessment on.	Not Determined	Not Determined	The EAP is of the opinion that a Geotechnical Assessment for the proposed development can and will only be undertaken once the final project design is confirmed, prior to the commencement of the construction phase. The EAP has not included this assessment as part of the application process.
Plant Species Assessment	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Terrestrial Plant Species. Note: This assessment was commissioned before the new regulations (October 2020) and thus follows regulations of March 2020.	Low Sensitivity	Medium Sensitivity	An identification, ranking and assessment of the present state, and impact of the proposed development, on plant and animal species has been provided in the terrestrial ecology report. Following the site verification, regulations make provision for linear activities such as the proposed development by stating that even the assessment and reporting requirements for areas identified as being of 'very high sensitivity' need not apply as impacts on terrestrial biodiversity are temporary in nature. The land disturbed by the power line development, can be returned to the current state within two years of the completion of the construction phase, and as such a Terrestrial Biodiversity Compliance Statement applies. An ecological impact assessment (including the assessment of plant and animal species) which assesses the biophysical environment of the proposed development has been conducted. Refer to Chapter 9 – 12 as well as Volume II.
Animal Species Assessment	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Terrestrial Animal Species. Note: This assessment was commissioned before the new regulations (October 2020) and thus follows regulations of March 2020.	High Sensitivity	Medium Sensitivity	

3.3 Specialist Methodology

To evaluate the potential environmental impacts and verify the sensitivity of the screening report, information relating to the existing environmental conditions was collected through field and desktop research; this is known as the baseline. Where no specialist was appointed, the EAP conducted high level screening to confirm the significance ratings of the impacts the proposed development may have on the environment, by:

- Desk top based reviews of literature available on the proposed site; and
- Reviewing the previous applications, such as for the DA2S WEF, within the affected area.

Based on the results of the DEFF screening report⁹, referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended, soil and agriculture, aquatic, ecological, avifauna and heritage specialist studies were conducted for this proposed development.

Each of the specialist assessments followed a systematic approach to the assessment of impacts, with the principal steps being:

- Description of existing environment/baseline conditions;
- Site Sensitivity Verification;
- Prediction and Assessment of likely potential impacts, including cumulative impacts (both positive and negative);
- Identification of appropriate mitigation measures; and
- Assessment of residual (potential) environmental impacts.

3.3.1 Soils and Agriculture

The assessment was based on a desktop analysis of existing soil and agricultural potential data and other data for the site, which is considered extensive and more than adequate for a thorough assessment of all the agricultural impacts of the proposed development. A field investigation was not considered necessary due to the low agricultural sensitivity of the site.

The ratings of impacts were based on the specialist's knowledge and experience of the field conditions of the environment in which the proposed development is located, and of the impact of disturbances on that agricultural environment.

3.3.2 Freshwater and Wetlands (Aquatic)

The assessment included delineating any natural waterbodies, and assessing the potential consequences of the proposed alignment (inclusive of a 500m wide corridor – The study area) on the surrounding watercourses. This was based on information collected during various site visits conducted within the region (i.e., adjoining farms and or projects directly adjacent to study area) in August 2014, May 2016 for surrounding projects, and a site-specific assessment in October 2019.

3.3.3 Terrestrial Ecology (Fauna and Flora)

Following the protocol listed in National Gazette, No. 43110 of 20 March, 2020, when applying for Environmental Authorisation, the information presented by the DEFF online screening tool was consulted to determine the sensitivity of the project site prior to the field site visit and ground-truthing. Existing studies and various databases of distribution records were also consulted to determine the potential species of flora and fauna that could

⁹ The DEFF Screening Report will be submitted to the Competent Authority with the Application Form for this Proposed Development.

occur on the site. In addition to the desktop study, a five-day site walkthrough covering the power line corridor and switching station was conducted between 10 and 14 February 2020.

While the commissioning of the specialist assessment occurred prior to the publication of The National Gazette, No. 43110 of 20 March 2020, the assessment was conducted to align with the Terrestrial Biodiversity Protocol prescribed therein to assist the Competent Authority in the decision making process as the protocol was largely materially unchanged from the minimum assessment and reporting requirements described in The National Gazette No. 42451 of 10 May 2019 and the specialist assessment was concluded prior to the publication of The National Gazette, No 43855 of 30 October 2020.

An external specialist review was conducted on the Ecological Impact Assessment Report. Following the review, the report was updated based on comments from the reviewer (Volume II).

3.3.4 Avifauna

While no specific protocols for the avifaunal assessment of linear infrastructure are listed in the National Gazette, No. 43110 of 20 March, 2020, the information presented by the online screening tool was consulted to determine the sensitivity of the project site prior to the field site visit and ground-truthing. A five-day site walkthrough covering the power line corridor and switching station was conducted between 10 and 14 February 2020. Databases were also studied to gain an understanding of the project baseline for avifauna. Available bird micro-habitats were assessed and a list of all bird species was recorded.

An external specialist review was conducted on the Avifaunal Impact Assessment Report. Following the review, the report was updated based on comments from the reviewer (Volume II).

3.3.5 Heritage, Archaeology and Palaeontology

The assessment comprised an archaeological walkover survey and impact assessment of the proposed development site, a desktop palaeontological impact assessment (PIA) and the production of an integrated heritage impact assessment (HIA) which addresses the impacts of the project on heritage resources.

3.4 Identification of Potential Impacts

The identification of potential impacts covers the three phases of the proposed development: construction, operation and decommissioning. During each phase, the potential environmental impacts may be different.

The project team has experience from environmental studies for other projects in the locality of the proposed development as well as other WEF and Grid Connection applications. The team is, therefore, able to identify potential impacts addressed in the BA based on their experience and knowledge of the type of development proposed and the local area. Their inputs informed the scope for the BA.

Each specialist assessment considered:

- The extent of the impact (local, regional or (inter) national);
- The intensity of the impact (low, medium or high);
- The duration of the impact and its reversibility;
- The probability of the impact occurring (improbable, possible, probable or definite);
- The confidence in the assessment; and
- Cumulative impacts.

Following identification of potential environmental impacts, the baseline information was used to predict changes to existing conditions and undertake an assessment of the impacts associated with these changes.

3.4.1 Assessment of Potential Effects

The potential impact that the Transmission Lines and Switching Station may have on each environmental receptor could be influenced by a combination of the sensitivity and importance of the receptor and the predicted degree of alteration from the baseline state (either beneficial or adverse).

Environmental sensitivity (and importance) may be categorised by a multitude of factors, such as the rarity of the species; transformation of natural landscapes or changes to soil quality and land use.

The overall significance of a potential environmental impact is determined by the interaction of the above two factors (i.e., sensitivity/importance and predicted degree of alteration from the baseline).

Specialists, in their terms of references, were supplied with a standard method with which to determine the significance of impacts to ensure objective assessment and evaluation, while enabling easier multidisciplinary decision-making. The methodology¹⁰ as outlined below indicates the categories for the rating of impact magnitude and significance.

The assessment methodology that was used is in accordance with the 2014 EIA Regulations (as amended). The significance of environmental impacts is a function of the environmental aspects that are present and to be impacted on, the probability of an impact occurring and the consequence of such an impact occurring before and after implementation of proposed mitigation measures.

3.4.1.1 Extent (spatial scale)

L	M	H
Impact is localised within site boundary	Widespread impact beyond site boundary; Local	Impact widespread far beyond site boundary; Regional/national

3.4.1.2 Duration

L	M	H
Quickly reversible, less than project life, short term	Reversible over time; medium-term to life of project	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

3.4.1.3 Intensity (severity)

Type of Criteria	Negative			Positive		
	H-	M-	L-	L+	M+	H+
Qualitative	Substantial deterioration death, illness or injury, loss of habitat /diversity or resource,	Moderate deterioration, discomfort, Partial loss of habitat /biodiversity /resource or slight or alteration	Minor deterioration, nuisance or irritation, minor change in species/habitat/diversity or	Minor improvement, restoration, improved management	Moderate improvement, restoration, improved management, substitution	Substantial improvement, substitution

¹⁰ Adapted from T Hacking, AATS – Envirolink, 1998: An innovative approach to structuring environmental impact assessment reports. In: IAIA SA 1998 Conference Papers and Notes.

	severe alteration or disturbance of important processes.		resource, no or very little quality deterioration.			
Quantitative	Measurable deterioration Recommended level will often be violated (e.g., pollution)	Measurable deterioration Recommended level will occasionally be violated	No measurable change; Recommended level will never be violated	No measurable change; Within or better than recommended level.	Measurable improvement	Measurable improvement

3.4.1.4 Probability of Occurrence

L	M	H
Unlikely; low likelihood; Seldom No known risk or vulnerability to natural or induced hazards.	Possible, distinct possibility, frequent Low to medium risk or vulnerability to natural or induced hazards.	Definite (regardless of prevention measures), highly likely, continuous High risk or vulnerability to natural or induced hazards.

3.4.1.5 Status of the Impact

The specialist should describe whether the impact is positive, negative or neutral for each parameter. The ranking criteria are described in negative terms. Where positive impacts are identified, use the opposite, positive descriptions for criteria.

3.4.1.6 Degree of Confidence in Predictions:

The degree of confidence in the predictions, based on the availability of information and specialist knowledge, is to be stated.

3.4.1.7 Consequence: (Duration x Extent x Intensity)

Having ranked the severity, duration and spatial extent, the overall consequence of impacts is determined using the following qualitative guidelines:

Intensity = L				
Duration	H			
	M			Medium
	L	Low		
Intensity = M				
Duration	H			High
	M		Medium	
	L	Low		
Intensity = H				
Duration	H			
	M			High
	L	Medium		
		L	M	H
Extent				

Positive impacts are ranked in the same way as negative impacts but result in high, medium or low positive consequence.

3.4.1.8 Overall Significance of Impacts

Combining the consequence of the impact and the probability of occurrence provides the overall significance (risk) of impacts.

PROBABILITY	Definite Continuous	H	MEDIUM		HIGH
	Possible Frequent	M		MEDIUM	
	Unlikely Seldom	L	LOW		MEDIUM
			L	M	H
			CONSEQUENCE		

3.4.1.9 Mitigation Measures

Measures to avoid, reduce or remedy significant adverse impacts identified, are termed mitigation measures. Where the assessment process identifies any significant adverse impacts, mitigation measures are proposed to reduce those impacts where practicable. Such measures include the physical design and operational measures. Design alterations such as the route of the servitude to avoid certain sensitive receptors are mitigation embedded into the design of the proposed development, i.e., embedded mitigation.

This strategy of avoidance, reduction and remediation is a hierarchical one which seeks:

- First to avoid potential impacts;
- Then to reduce those which remain; and
- Lastly, where no other measures are possible, to propose compensatory measures.

Each specialist consultant identified appropriate mitigation measures (where relevant) (Section 9 and 10 of this report).

3.5 Cumulative Impact Assessment

In accordance with the EIA Regulations, 2014 (as amended), consideration should also be given to 'cumulative impacts'.

By definition, cumulative impacts are those that result from incremental changes caused by past, present or reasonably foreseeable future actions together with the proposed development. Cumulative impacts are the combined impacts of several developments that are different to the impacts from the developments on an individual basis.

For the purpose of this assessment, cumulative impacts are defined and have been assessed in the future baseline scenario, i.e., cumulative impact of the proposed development = change caused by the proposed development when added to the cumulative baseline (which includes all other identified relevant developments). In the cumulative assessment, the effect of adding the proposed development to the cumulative baseline is assessed.

The selection of projects to be included in the assessment of cumulative impacts, was based on the knowledge and status of the surrounding areas at the time of writing the BA Report (Figure 3.1 Cumulative Developments and Transmission Lines within up to 35 km of the proposed development), and the applicable renewable energy projects and existing transmission lines are given in tables 3.2 and 3.3 respectively.

Each of the specialists used existing publicly available information for the relevant developments that occur within an up to 35 km radius of the proposed development, in order to assess the cumulative impacts. Cumulative impacts that have been considered are those residual impacts that remain medium to high post-mitigation and are highly qualitative and based on specialists' and EAPs knowledge.

Table 3.2 List of Renewable Energy Projects within up to 35 km of the Proposed Development

No.	DEFF Reference No.	Classification	Status of Project
1	12/12/20/2250/3	Solar PV	Approved
2	14/12/16/3/3/2/382/6	Solar PV	Approved
3	12/12/20/2048/2	Solar PV	Approved
4	14/12/16/3/3/2/382/3	Solar PV	Approved
5	12/12/20/2048/1	Solar PV	Approved
6	12/12/20/2250/4/AM4	Solar PV	Approved
7	14/12/16/3/3/2/382/2	Solar PV	Approved
8	12/12/20/2025/1	Solar CSP	Approved
9	14/12/16/3/3/2/382/5	Solar PV	Approved
10	12/12/20/2500	Solar PV	Approved
11	12/12/20/2250/5	Solar PV	Approved
12	12/12/20/2177	Solar PV	Approved
13	12/12/20/2025	Solar CSP	Approved
14	12/12/20/2048/3	Solar PV	Approved
15	14/12/16/3/3/2/740	Solar PV	Approved
16	14/12/16/3/3/2/382/4	Solar PV	Approved
17	12/12/20/2048/4	Solar PV	Approved
18	12/12/20/2250	Solar PV	Approved
19	12/12/20/2250/2	Solar PV	Approved
20	14/12/16/3/3/2/403	Solar PV	Approved
21	12/12/20/2250/1	Solar PV	Approved
22	12/12/20/2250/4	Solar PV	Approved
23	12/12/20/2498/AM3	Solar PV	Approved
24	12/12/20/2025/2/A	Solar PV	Approved
25	14/12/16/3/3/2/382/1	Solar PV	Approved
26	12/12/20/1673	Solar PV	Approved
27	14/12/16/3/3/2/382/7	Solar PV	Approved
28	12/12/20/2025/2	Solar PV	Approved
29	12/12/20/2463/1/AM7	WEF	Approved

Although majority of these projects are Solar Energy Facilities, the impacts of these developments are relevant as the majority also include associated power line and electrical infrastructure as they influence the various specialist cumulative impact assessments for the proposed development. It should be noted however, that it is highly unlikely (primarily

due to grid capacity constraints) that all of these proposed projects would be built in the medium or even long-term.

Table 3.3 List of Existing Electrical Grid Infrastructure within up to 35 km of the Proposed Development

Name	Line Start	Line End	Line Status	Line kV
Hydra Kronos 1	Hydra	Kronos	Existing	400 kV Line
Hydra Poseidon 1	Hydra	Poseidon	Existing	400 kV Line
Hydra Poseidon 2	Hydra	Poseidon	Existing	400 kV Line
Beta Hydra 1	Beta	Hydra	Existing	400 kV Line
Hydra Perseus 2	Hydra	Perseus	Existing	400 kV Line
Beta Hydra 2	Beta	Hydra	Existing	765 kV Line
Hydra Roodekuil 2	Hydra	Roodekuil	Existing	220 kV Line
Hydra Roodekuil 1	Hydra	Roodekuil	Existing	132 kV Line
Hydra Ruigtevallei 1	Hydra	Ruigtevallei	Existing	220 kV Line
Hydra Ruigtevallei 2	Hydra	Ruigtevallei	Existing	220 kV Line
Droerivier Hydra 1	Droerivier	Hydra	Existing	400 kV Line
Droerivier Hydra 3	Droerivier	Hydra	Existing	400 kV Line
Hydra Perseus 3	Hydra	Perseus	Existing	400 kV Line
Droerivier Hydra 2	Droerivier	Hydra	Existing	400 kV Line
Gamma Perseus 1	Gamma	Perseus	Existing	765 kV Line
Gamma Hydra 1	Gamma	Hydra	Existing	765 kV Line
Hydra Ndhlovu	Hydra	Ndhlovu	Existing	132 kV Line

4 PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) follows the requirements of Section 24 (5) and Chapter 6 (41, 42, 43, and 44) of GN R. 326 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 (as amended), as well as the Public Participation Guidelines in terms of NEMA, 1998 EIA Regulations, 2014.

Due to the National COVID-19 Pandemic the DEFF published Government Notice 43412 on 5 June 2020. Included in this notice was the requirement to submit a Public Participation (PP) Plan to the DEFF prior to the commencement of a PP Process. A PP Plan was designed to show how we aim to provide sufficient and accessible information to all Interested and Affected Parties (I&APs) in a safe manner during National COVID-19 Pandemic. This plan was submitted and approved by the DEFF on 9 July 2020. A copy of this is being submitted with the application form to the DEFF. If any new regulations or notices are published before the commencement of the PP Process for this application, these will be taken into consideration.

The primary aims of the public participation process are:

- To inform Interested and Affected Parties (I&APs) of the proposed development;
- To identify issues, comments and concerns as raised by I&APs;
- To promote transparency and an understanding of the project and its potential consequences;
- To facilitate open dialogue and liaise with all I&APs;

- To assist in identifying potential environmental (biophysical and socio-economic) impacts associated with the proposed development; and
- To ensure that all I&AP issues and comments are accurately recorded, addressed and documented in a Comments & Response Report.

The latest I&AP database of the authorised DA2S WEF was used as the baseline for this BA report. This database is extensive and has been compiled and revised over a number of years since 2011, and most recently updated and revised as part of an amendment process for the DA2S WEF (DEFF Ref. No. 12/12/20/2463/1/AM7). As part of the Initial Notification, notices were placed in the Echo and Volksblad newspapers; site and posters notices were erected in the town of De Aar and e-mail notifications were sent to pre-identified I&APs (Appendix C).

Notification letters via email and registered mail will be sent to all I&APs informing them of the availability of the Draft BA Report for review and comment. The report will be made available for public viewing at the site office¹¹ of the Operational Longyuan Mulilo De Aar 2 North WEF in the town of De Aar as a hard copy, and electronic CDs will be available. Additionally, the report can be viewed digitally on the Arcus website (www.arcusconsulting.co.za/projects).

The draft BA Report (Arcus, September 2020) was subjected to a 30 day comment period from the 17 October 2020 to the 19 November 2020 (both days inclusive). During the public comment period, the application process was suspended. The draft BA Report (this report, Arcus, April 2021) has since been updated slightly¹² **and is therefore being subjected to another 30 day comment period.**

Registration of I&APs will continue throughout the process, and the I&AP database will be updated accordingly, based on comments received and included in the final BA Report.

A Comments and Response Table reflects the comments received before finalisation of this draft BA report, including any comments received during the initial 30 day comment period (Appendix C). The Comments and Response Table will be updated throughout the process as comments are received, and responded to and addressed by the project team, i.e., EAP, Applicant and Specialists as applicable and will be included in Appendix C of the final BA Report.

5 BASELINE ENVIRONMENT

This section provides a brief description of the physical, biological, ecological, social, economic and cultural setting in which the proposed development is to be located. The information provided is based on actual studies conducted by specialist consultants and from existing literature and sources which was available for the study area and its surrounds. This baseline will provide the context in which the proposed development will be constructed.

5.1 Regional and Local Context

The Northern Cape is the largest province in South Africa, taking up nearly a third of the country's land area. From the 2011 South African Census¹³, the geographical land area of Northern Cape was presented as 372 889 km² and population calculated a sum of 1 193 780 people. Although the largest province of South Africa, the Northern Cape is the least populous. The proposed development, in its broader context is located approximately 15 km east of the town of De Aar and falls within the Emthanjeni Local Municipality and

¹¹ Access to the hard copy or a CD at the Longyuan Site Office in De Aar will be by appointment only and during business hours 09h00 – 16h00.

¹² Update included selection of preferred alternative based on DEFF requirements as per the EGI Gazette as per GN 113.

¹³ http://www.statssa.gov.za/census/census_2011/census_products/Census_2011_Census_in_brief.pdf

Pixley ka Seme District Municipality of the Northern Cape Province. De Aar, approximately 84.23 km² is the largest town in the Emthanjeni Local Municipality and is the seat of the greater Pixley ka Seme District Municipality. This district is one of five districts in the Northern Cape Province of South Africa. De Aar has an estimated population of around 42,000 inhabitants and is said to be the second-most important railway junction in the country, situated between Cape Town and Kimberley. De Aar is also a primary commercial distribution center for a large area of the central Great Karoo. The majority of the population in this district, 77% of its 186,351 people speak Afrikaans as first language (2011 Census).

The Northern Cape is home to nearly 50% of the renewable energy developments in South Africa, especially around the town of De Aar. The proposed development requires authorisation to contribute to the increased social, economic and employment benefits to the local community and enable the DA2S WEF to contribute to the positive increase in 'green energy' in this province (and town). The De Aar town is also located within the Renewable Energy Strategic Transmission Corridor, approved by Cabinet on the 17 February 2016, which has been identified as areas where long term electricity grid infrastructure be developed and where an integrated decision-making process for applications for environmental authorisation in terms of NEMA, 1998, will be followed.

The identification of the location of the transmission line corridors was informed by the shortest and most feasible route between the authorised DA2S WEF and the existing Eskom Hydra Substation and the importance of social and economic development in the town of De Aar. Further consideration was the location of similar infrastructure and available road network in the area, with the proposed routes primarily following existing infrastructure routes.

The most sensitive receptor may be the N10, which is a national route in South Africa connecting from the Northern Cape Namibian border at Nakop, via Cradock, De Aar and Upington to Port Elizabeth on the Eastern Cape coast. The closest view point to the N10 for the proposed development is at the existing Eskom Hydra Substation, which is located approximately 2 km from the road. The R399 crosses the site in the east, and is more than 6 km from the top of the plateau. This provincial road carries traffic during the day yet is relatively quiet during the night. There are a number of gravel roads traversing the proposed site, mainly used by the farmers in the area. Access to the proposed development is between 2 km and 25 km via the national road, N10 and the town of De Aar is located to the north-west of the proposed development. View from homesteads in the area has already been impacted by the existing electric infrastructure in the area.

5.2 Climatic Conditions

Climate change is expected to affect the proposed development site over the lifetime of the proposed development; however, the nature, scale and severity of climate change effects are uncertain. Given this uncertainty, the existing environment is assumed to remain constant throughout the lifetime of the proposed development, and forms the current and future baseline for the impact assessments.

Rainfall in the De Aar area peaks in autumn (March) and the mean annual precipitation for De Aar is about 300 mm. Mean maximum and minimum monthly temperatures for De Aar are 37.1°C and -4.8°C for January and July, respectively. Rainfall for South Africa is given as 337 mm per annum (The World Bank Climate Change Knowledge Portal, undated).

5.3 Biophysical Characteristics

The proposed development site is currently used for low-intensity grazing and has little potential for other types of land use. Grazing can continue on the site during the construction and operation of the development.

The proposed development is located on level Karoo plains, with low slope gradients, at an altitude of between 1,260 and 1,350 metres (Figure 5.1 reflects land use within the proposed development area). The dominant soils are shallow, calcareous, sandy loam soils on underlying rock, of the Mispah, Glenrosa and Swartland soil forms. The shallow soil depth, low rainfall and high evapotranspiration limits the agricultural and grazing potential of the site. The underlying geology is comprised of shales, mudstone and sandstone of the Beaufort Group and the Karoo Supergroup, and Dolerite intrusions are frequent. The proposed grid connection routes cross a variety of terrains. The route starts on a large flat mountain plateau which is where the authorised DA2S WEF is located. The plateau rises at least 100 m above the surrounding plains at an altitude of 1,500 metres and is generally flat rocky outcrops and is covered in typical Karoo scrub and grasses. Below the plateau, the grid connection routes traverse a series of flat valley bottoms divided by intrusive dolerite koppies. These flat valley bottoms are almost without exception seasonal river and stream drainages, the largest of which is the Brak River on Carolus Poort 3/3 and here the land is low-lying. There are several non-perennial water courses, typical of arid areas that drain the project area to the north-west.

Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain-fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. Values below 8 are generally not suitable for production of any cultivated crop.

Land capability evaluation values range from 1 to 7 across the project area, with the majority of the site falling within the 5 and 6 class range. Agricultural limitations include climatic moisture availability and shallow, stony soils. These factors render the site unsuitable for any kind of mainstream cultivation without irrigation, and limit it to low density grazing only.

The long-term grazing capacity of the site is fairly low at 20 hectares per large stock unit. The development is located within a sheep farming agricultural region and is currently used only for grazing. There is no cultivation across the project area. The only agricultural infrastructure is fencing of grazing camps, wind pumps and stock watering points.

Two broad vegetation types occur in the study area¹⁴, namely the Northern Upper Karoo (NKu3) and Besemkaree Koppies Shrubland. These areas represent the Nama-Karoo and Grassland biomes. Both of these biomes are fairly structurally homogenous, with few notable different habitat categories, such as lowland plains, plateau, rocky ridges and outcrops, and washes and drainage lines vegetation. The Northern Upper Karoo occurs in the lowland areas of the study site while the Besemkaree Koppies Shrubland occurs on the slopes of koppies and covering the tops of tafelbergs. Both of these broad vegetation types are listed as *Least Threatened* and neither are listed in the National List of Ecosystems that are Threatened and in Need of Protection (GN 1002 2012) published under National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) which lists national vegetation types that are afforded protection based on transformation rates.

The species and habitats found within them are fairly widespread and not unique to the project site. In many of these areas, vegetation is sparser and there are large open eroded and deflated surfaces where archaeological material is often exposed.

¹⁴ Mucina, L. and Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland, in *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

The Northern Cape Critical Biodiversity Area (CBA) Map was published in 2016¹⁵ and it “updates, revises and replaces all older systematic biodiversity plans and associated products for the province”. The Northern Cape CBA map classifies the natural vegetation of the province according to conservation value in decreasing value, as follows:

- Protected Areas;
- Critical Biodiversity Area 1 (Irreplaceable Areas);
- Critical Biodiversity Area 2 (Important Areas);
- Ecological Support Areas; and
- Other Natural Area.

Features within the study area falls within three of these classes (Figure 5.2), as follows:

- Critical Biodiversity Area 1 and 2 (CBA): The study area crosses a small section of CBA2 area and a small patch of CBA1 area;
- Ecological Support Area (ESA): The whole study area falls within an ESA mostly due to the presence of the large IBA surrounding De Aar.

Both vegetation types are largely intact with very little prospect of long-term transformation through agricultural practices, the species and habitats found within them are therefore fairly widespread and not unique to the project site.

5.4 Ecological Characteristics

Fifty-one plant species that were listed on the Database of Southern Africa (BODATSA) database¹⁶ on the SANBI website¹⁷ for the study area and could potentially occur in the study site are protected under the Northern Cape Nature Conservation Act, 2009. From the field survey, the following species were particularly abundant on the project site: Steekvy (*Ruschia intricata*), Eastern Candelabra (*Brunsvigia radulosa*), Narrow-leaf Cotton Bush (*Gomphocarpus fruticosus*), Krimpsiektebos (*Lessertia annularis*), Sorrel (*Oxalis depressa*) and Cape Saffron (*Jamesbrittenia aurantiaca*). Despite not being threatened, any impacts on these species will require a permit from the relevant authorities. Many of these species are widespread and not of any conservation concern, but protected due to the fact that the Northern Cape Nature Conservation Act, 2009, protects entire families of flowering plants irrespective of whether some members are rare or common.

An area of roughly 50 km around the project site was searched for potential red list plant species of concern. Despite this broad search, there are very few species that were evaluated to be of conservation concern that could potentially occur in the project area. Similarly, none of the plant species listed on the BODATSA database for the study area or recorded on site were listed as protected by NEMBA. And one tree species, the Shepherd's Tree (*Boscia albitrunca*) is listed to occur in both habitat types present on the study site and is protected under the National Forest Act, 1998. However, this species was not recorded to be present on the study site during the ecological survey.

The overall sensitivity of the vertebrate species that could potentially occur in the project area is considered to be high, based on all threatened (*Critically Endangered*, *Endangered* or *Vulnerable*), near threatened¹⁸ or important vertebrate species that could occur in the study area and that may have habitat preferences that include habitats available in the study area. However, these species are not likely to be uniformly distributed across the

¹⁵ Oosthuysen, E. & Holness, S. 2016. Northern Cape Critical Biodiversity Areas (CBA) Map. Department of Environment and Nature Conservation & Nelson Mandela Metropolitan University.

¹⁶ South African National Biodiversity Institute. 2016. Botanical Database of Southern Africa (BODATSA) [dataset]. doi: to be assigned.

¹⁷ <http://newposa.sanbi.org/> accessed January 20 2020.

¹⁸ As listed in Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The 2016 Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

project site and the sensitivity of the majority of the site for vertebrates is considered to be low when the project site is taken into context of the broader area and surrounds. The habitats and microhabitats present on the project site are largely widespread. Active burrows were seen in close proximity to existing power line infrastructure during the site visit, indicating that the presence of these structures did not deter burrowing animals from the site. The overall invertebrate sensitivity of the project area is considered to be low.

5.5 Avifaunal Characteristics

Avifaunal microhabitats occur at a smaller spatial scale than vegetation types and are shaped by factors including vegetation type, topography, land use, food sources and man-made factors (e.g., the introduction of livestock and alien vegetation as well as the construction of infrastructure). Investigation of the project site revealed lowland plains; cultivated vegetation; rivers; drainage lines; dams; rocky ridges; slopes and outcrops; plateaux; and powerlines as bird micro habitats, either on or within approximately 2 km of the project site.

South African Bird Atlas Project 2 (SABAP2) data was examined for the pentads (which are approximately 8 km x 8 km squares) in the study area. A total of 195 species were recorded by SABAP2 which includes 13 species classified as *Endangered*, *Near Threatened* or *Vulnerable* and 25 endemic or near-endemic species (Table 5.1). Due to the relatively few surveys conducted in some of the pentads (indicated by the number of cards submitted) several species which are likely to occur in the area have not been recorded by SABAP, Kori Bustard (*Near Threatened*) which was observed on site during the walk-through is notably absent from the data.

Table 5.1: Red-data and endemic or near-endemic species listed by SABAP2 and observed during the site walk-through

Species	Red Data	Endemic or Near-endemic	Observed
Bustard, Ludwig's	EN		*
Eagle, Martial	EN		
Eagle, Tawny	EN		
Pipit, African Rock	NT	*	*
Courser, Double-banded	NT		
Crane, Blue	NT		
Flamingo, Greater	NT		
Korhaan, Karoo	NT		*
Courser, Burchell's	VU		
Eagle, Verreaux's'	VU		*
Falcon, Lanner	VU		*
Secretarybird	VU		
Stork, Black	VU		
Buzzard, Jackal		*	*
Canary, Black-headed		*	
Chat, Sickle-winged		*	
Eremomela, Karoo		*	*
Flycatcher, Fairy		*	*

Species	Red Data	Endemic or Near-endemic	Observed
Flycatcher, Fiscal		*	*
Francolin, Grey-winged		*	*
Korhaan, Blue		*	
Lark, Black-eared Sparrow-		*	*
Lark, Eastern Long-billed		*	*
Lark, Karoo		*	*
Lark, Large-billed		*	*
Lark, Melodious		*	
Prinia, Karoo		*	
Starling, Pied		*	*
Sunbird, Southern Double-collared		*	*
Swallow, South African Cliff		*	
Thrush, Karoo		*	
Tit, Grey		*	
Tit-Babbler, Layard's		*	*
Warbler, Cinnamon-breasted		*	
Warbler, Namaqua		*	
Weaver, Cape		*	*
White-eye, Cape		*	*

The entire project site falls within the large Platberg-Karoo Conservancy (ZA028). The conservancy covers the entire districts of De Aar, Philipstown and Hanover in the south-eastern portion of the Northern Cape Province. Although the land in the Important Bird Areas is primarily used for grazing and agriculture, it includes the suburban towns of De Aar, Philipstown, Petrusville and Hanover. This huge area lies in the plains of the central Great Karoo, forming part of the South African plateau and holds important populations of two globally threatened species (Blue Crane and Lesser Kestrel), several biome-restricted species and important populations of other arid-zone birds. Lesser Kestrel have roosts throughout the area, including large roosts (5 000 – 10 000 individuals) in the towns of De Aar, Hanover and Philipstown; they are frequently seen foraging in the conservancy in summer, when close to 10% of the global population of Lesser Kestrels roost in this IBA. Some of the dams are important roosts; during summer 1996/97, more than 850 Blue Crane were counted on a dam in the IBA¹⁹.

The lowland karroid plains are particularly good for Ludwig's Bustard, Kori Bustard and large numbers of Karoo Korhaan, Karoo Lark, Karoo Chat, Tractrac Chat, Sickle-winged Chat, Lark-like Bunting and Karoo Long-billed Lark. In the grassier areas Blue Korhaan are common. Black Harrier are occasionally seen quartering the plains, where huge numbers of Blue Crane regularly congregate. Tawny Eagle and Martian Eagle breed on the power lines in the area. The belts of riverine *Vachellia* (Acacia) woodland support Namaqua Warbler, Layard's Tit-babbler and Grey Tit. Pale-winged Starling and African Rock Pipit occur in rocky gorges and kloofs. Other arid-zone species occurring within the conservancy are Pale Chanting Goshawk, Pririt Batis, Fairy Flycatcher and White-throated Canary.

¹⁹ <http://datazone.birdlife.org/site/factsheet/platberg-karoo-conservancy-iba-south-africa/text>

Collision (and electrocution) impacts with the existing power lines in the district have been identified as a high threat to large terrestrial birds such as cranes, bustards, and raptors. Power lines can, however, also be beneficial to large raptors such as Martial Eagle which prefer to breed on pylons in areas where large trees are uncommon.

Chris van Rooyen Consulting conducted an Avifaunal Impact Assessment Study in 2014 on the Longyuan Mulilo De Aar 2 North (Pty) Ltd 132kV overhead power line to connect the Longyuan Mulilo De Aar 2 North Wind Energy Facility (DEFF Ref. No. 12/12/20/2463/2) to the national transmission grid via Hydra Substation. This proposed power line routes assessed in this study runs adjacent to the power line assessed by van Rooyen (2014) for approximately 12 km. van Rooyen (2014) identified 11 Red Data species that could potentially occur in the area, and concluded that mitigation risks associated with collisions and habitat destruction would be low. A number of Verreaux's Eagle nests that occur in the study area were mapped by van Rooyen (2014) including a nest on a cliff within 500 m of the proposed power line route assessed in this study (Figure 11.1, 11.1c and 11.1d). WildSkies Ecological Services conducted an Avifaunal Impact Assessment Study on the Castle Wind Energy Facility directly adjacent to the land portions relevant to this study. Smallie (2014) scored the risk of the WEF for 15 target species (including Egyptian Goose) but also observed several notable species on site including Lanner Falcon, Amur Falcon, Secretarybird, Booted Eagle and Black-chested Snake Eagle. In discussing the mitigation of the grid connection, Smallie (2014) recommended that power line infrastructure be built to the east of the existing Eskom Hydra Roodekuil 220kV power line, and that the line will need to conform to all Eskom standards in terms of bird friendly pole monopole structures with Bird Perches on every pole-top (to mitigate for bird electrocution), and anti-bird collision line marking devices (to mitigate for bird collision) on the earth wires of high risk sections. Applicable mitigation measures included in these studies have been included in the avifauna assessment.

Powerline mortality data from around De Aar were obtained from the EWT to determine which species have suffered mortalities as a result of electrical distribution infrastructure in the area. The data received was collected between 2001 and 2018 and included collision mortality incidents of Ludwig's Bustard, Kori Bustard, Blue Crane, Verreaux's Eagle and an Unknown Flamingo. Electrocution mortalities included Verreaux's Eagle, Cape Eagle-owl, Lanner Falcon and Pale-chanting Goshawk.

Records of mortalities associated with the expansive stretches of transmission lines from the Hydra substation between 2008 and 2016 revealed that the top ten affected species by transmission lines in the larger area included Ludwig's Bustard, Blue Crane, Northern Black Korhaan, unidentified sp., White Stork, Pied Crow, Secretarybird, Kori Bustard, Karoo Korhaan and Blue Korhaan. No calculations regarding mortalities per km or per year were performed as the data covers a number of years include power lines which cross areas that may pose a greater risk to birds and the numbers may therefore be misleading. These data were nevertheless useful to assist in the identification of species, including the Ludwig's Bustard, Kori Bustard, Karoo Korhaan, Northern Black Korhaan, Secretarybird and Verreaux's Eagle, shown to be at risk in the area.

A single 300 m High Sensitivity 'no-go' buffer was identified surrounding an active Verreaux's Eagle Nest. The nest was observed on the cliffs (-30.595564, 24.265331) near the existing transmission line during the site visit, and is assumed to still be in use as an adult pair of Verreaux's Eagle was seen perched on the pylon nearest the nest, however, successful breeding at the nest site during the previous season (i.e., winter 2019) could not be confirmed.

Focal species were earmarked for this study by identifying species most likely to be negatively affected by the proposed development. In general, large, heavy flying birds are more vulnerable to collision with overhead power lines, while perching raptors and storks

are more vulnerable to electrocution. Smaller passerines are more likely to be impacted upon through habitat destruction and disturbance. Focal species likely to be impacted is: Ludwig's Bustard (*Endangered*), Martial Eagle (*Endangered*), Tawny Eagle (*Endangered*), Verreaux's Eagle (*Vulnerable*), Lanner Falcon (*Vulnerable*), Black Stork (*Vulnerable*), Secretarybird (*Vulnerable*), Great White Pelican (*Vulnerable*), Burchell's Courser (*Vulnerable*), Blue Crane (*Near Threatened*), Kori Bustard (*Near Threatened*), Karoo Korhaan (*Near Threatened*), Greater Flamingo (*Near Threatened*), African Rock Pipit (*Near Threatened*), Double-banded Courser (*Near Threatened*), White Stork (*Bonn Convention*) and South African Shelduck. In some cases, these species serve as surrogates for other similar species (as mitigation will be effective for both) such as the Greater Flamingo for Lesser Flamingo, Lanner Falcon for Amur Falcon, South African Shelduck for other geese and ducks and the various eagles for Osprey (*Bonn Convention*).

5.6 Rivers, Watercourses and National Freshwater Ecosystems Priority Areas

5.6.1 Present Ecological State and Conservation Importance

The Present Ecological State (PES) of a river represents the extent to which it has changed from near pristine condition (Category A) towards a highly impacted system where there has been an extensive loss of natural habit and biota, as well as ecosystem functioning (Category E).

The PES scores have been revised for the country and based on the current models, aspects of functional importance as well as direct and indirect impacts have been included (DHSWS, 2014). The current PES system also incorporates Ecological Importance (EI) and Ecological Sensitivity (ES) separately as opposed to Ecological Importance and Sensitivity (EIS) in the old model, although the new model is still heavily centered on rating rivers using broad fish, invertebrate, riparian vegetation and water quality indicators. The Recommended Ecological Category (REC) is still contained within the updated models, with the default REC being B, when little or no information is available to assess the system or when only one of the above-mentioned parameters are assessed or the overall PES is rated between a C or D.

The Present Ecological State scores (PES) for the main watercourses in the study area were rated as follows (DHSWS, 2014 – where B = Largely Natural and C = Moderately Modified):

Subquaternary Catchment Number	Present Ecological State	Ecological Importance	Ecological Sensitivity
5332	B	Low	Low
5391	C	Moderate	Low

In terms of the National Freshwater Ecosystems Priority Areas (NFEPA) assessment, all the watercourses within the site (Figure 11.1 and 11.1a-d) have been assigned a condition score of B (Nel et al. 2011), indicating that they are largely intact and have biological significance. These scores were substantiated by observations made in the field within the study area, and due to the overall lack of impacts or disturbance these scores for each of the watercourses within the site should be upheld. This was further substantiated by the inclusion of study area catchments into Critical Biodiversity Areas (Type 1 and 2), i.e., the wetland areas near the alignment crossing the Brak River in particular and Ecological Support Area.

5.7 Heritage and Cultural Landscape

There is a large number of pre-colonial archaeological sites and lithic scatters documented within the proposed development area, but only a handful of occurrences of colonial period

archaeological material or structures. The closest farm to the routes is a little less than one kilometre distant, on the far side of an existing powerline. The archaeological finds include Middle and Late Stone Age archaeological material, possible historic period stone structures, Khoikhoi stone kraal complexes and a single occurrence of late 19th / early 20th century historical material.

The area traversed by the grid connection routes crosses a range of geological rock and sediment types and almost the full range of palaeontological sensitivities described on the SAHRIS²⁰ palaeomap. The dolerite contains no fossils because they do not occur in intrusive, volcanic rock. Furthermore, when igneous dykes intrude through the overlying sediments, they tend to physically destroy any fossils in their paths and the heat they generate can destroy or alter fossils in the vicinity. The dolerites have a zero palaeontological sensitivity.

The Quaternary sands in the water courses are young enough to preserve fossils but having been washed down slopes and streams into rivers, any fossils would have been transported from their sites of origin and their context and associations with other fossil material in the assemblage will have been lost. These sediments are indicated as moderately sensitive by SAHRIS.

In contrast, the Ecca and Beaufort shales are much more likely to preserve fossils and many years of research by geologists and palaeontologists in the Karoo (for example, Rubidge, 1995, 2005; Johnson et al., 2006; Rubidge et al., 2016) has produced a detailed lithology and described the terrestrial flora and vertebrate fauna of these rocks. From this and other parts of the Karoo the Tierberg Formation has produced a number of trace fossils of worm burrows, root casts and invertebrate trackways (van Dijk et al., 2002; Almond, 2013). Fossil plants are rare in this part of the Karoo basin but there are records of fragments of silicified wood from east of De Aar (Almond, 2013).

The Adelaide Subgroup, undifferentiated in this area, can be divided into the Abrahamskraal or Koonap Formations and the Teekloof or Middleton and Balfour Formations. Expected vertebrate fossils are a variety of dinocephaleans, gorgons and therocephaleans and some fish but according to Almond's site surveys (Almond 2012a, 2012b, 2012c), vertebrate fossils are rare as there is little exposure.

Potential fossil plants are typical Permian impressions of *Glossopteris* leaves, lycopods, sphenophytes and ferns, and silicified wood (Anderson and Anderson, 1085). Only fossil wood has been seen in the Adelaide Subgroup in this area (Almond, 2012a). The samples have not been collected or identified.

5.8 Social Context

The proposed development is located within the Emthanjeni Local Municipality Non-Urban Area, and is situated approximately 15 - 25 km east of the town of De Aar. The demographic data pertaining to the local municipality from Census 2011, is indicated in Table 5.2 below.

Table 5.2 Demographic data of the Emathanjeni Local Municipality Non-Urban Area

Geographic area	13,471.96 km ²
Population	42,356 people
Population density	3.14 per km ²
Households	10,457

²⁰ Online heritage management tool provided by SAHRA

Household density	0.78 per km ²	
Gender	People	Percentage
Male	20,722	48.92%
Female	21,634	51.08%
Population	People	Percentage
Coloured	24,436	57.69%
Black African	14,059	33.19%
White	3,388	8.00%
Other	237	0.56%
Indian or Asian	236	0.56%

The dependency ratio is calculated by adding together the percentage of children (aged under 15 years) and the older population (aged 65+), dividing the percentage by the working-age population (aged 15 - 64 years) and multiplying that percentage by 100. For the Emthanjeni Local Municipality the dependency ratio in 2011 was 47.3, and was higher in 2001 at 60.1. Between 2001 and 2011 the population of the Pixley Ka Seme District Municipality increased from 186 351 to 195 595, of that, the Emthanjeni Local Municipality contributed an increase with 45 404 in 2011 compared to a total population of 42 356 in 2001.

The main economic sectors of the municipality are community services (36%), transport (24%), finance (13%), trade (11%), agriculture (7%), electricity (4%), manufacturing (3%), and construction (2%).

6 NEED AND DESIRABILITY

The authorised DA2S WEF may be bid in the next bidding round (or in future bidding rounds) of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

The Strategic Environmental Assessment for Electricity Grid Infrastructure (EGI) in South Africa identified five Strategic Transmission Corridors, which are considered important to support the large scale electricity transmission and distribution infrastructure. The entire site of the proposed development falls within the Central Strategic Transmission Corridor.

Renewable energy is supported in terms of meeting the country's climate change goals, and in terms of reducing the country's dependence on fossil fuels as the main source of meeting the country's electricity requirements. The National Climate Change Adaptation Strategy²¹ (NCCAS) for The Republic of South Africa Version UE10, 13 November 2019, explains that the South African primary sectors, such as agriculture and mining, which are natural resource dependent are high consumption uses of energy. The NCCAS is adopting a cluster approach to assist with the changing climate conditions and the affect it has on various sectors. An action in support of this proposed development is the approach to "create a more adaptive energy system to reduce dependence on a centralised system and increase distributed generation, especially in rural areas". "This will involve encouraging the development of an adaptive and decentralised energy system so that the system is more resilient to climate disruptions".

²¹ https://www.environment.gov.za/sites/default/files/docs/nationalclimatechange_adaptationstrategy_ue10november2019.pdf

Both national and provincial policies and planning documents support the development of renewable energy facilities, and the authorised DA2S WEF cannot be developed without authorisation of a suitable grid connection (this application). The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan. At a provincial level, the development of renewable energy is supported by the Northern Cape Provincial Growth and Development Strategy and Northern Cape Provincial Spatial Development Framework. At a more localised level, in 2010 an investment and renewable energy conference declared the Pixley ka Seme District a 'Renewable Energy Hub'. The hub is aimed at providing cleaner energy and rural industrialisation in line with the IRP (2016) and IDP's of the municipality. Renewable energy generation is one of the key investment opportunities identified for the district. In addition to this, the Northern Cape Department of Transport, Safety and Liaison (NCDTSL) sought approval and funding for the De Aar Logistics Hub, which serves as a long-term strategy to optimise the freight and logistics functions of the province.

The need and desirability for these types of developments, and within the recommended Central Strategic Transmission Corridor, play a role in South Africa meeting its energy and climate change targets and also provides a socio-economic boost at the local level in areas that are in need of it.

The establishment of the transmission line and construction of the switching station in the area may place pressure on local services, specifically medical, education and accommodation, associated with the potential influx of people to the area in seek of employment opportunities. The potential impact or pressures on local services can be mitigated by employing local community members and should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of such infrastructure, within a Strategic Transmission Corridor, as an economic driver in the area.

A current requirement of the REIPPPP is that in the development of any WEF and associated infrastructure, the local economy must benefit through employment opportunities, skills development, and the development or enhancement of community infrastructure. The cumulative effect of the proposed development and other developments in the area has the potential to result in high significance positive socio-economic opportunities for the region.

The proposed project has the potential to create a number of socio-economic opportunities which will result in a positive social benefit. The positive cumulative impacts include creation of employment, training opportunities which enhances skills development, and the creation of downstream business opportunities.

South Africa faces serious electricity and water shortages due to its heavy dependency on fossil fuels and increases in demand. There is, therefore, a strong need for additional electricity generation options to be developed and to diversify the sources of energy that feed into the national grid.

The purpose of the proposed development, situated within a Strategic Infrastructure Corridor, is to export the renewable energy, generated by the authorised DA2S WEF, to the national grid. There are many other socio-economic benefits that could be realised should the project be authorised. These include (but are not limited to):

- Reduced air pollution emissions - burning fossil fuels generates CO₂ emissions which contribute to global warming. In addition, burning fossil fuels produces emissions of sulphurous and nitrous oxides which are hazardous to human health and impact on ecosystem stability;
- Water resource-saving - conventional coal-fired power stations use large quantities of water during their cooling processes. WEFs require limited amounts of water during

- construction and almost no water during operation. As a water-stressed country, South Africa should be conserving such resources wherever possible;
- Improved energy security - renewables can often be deployed in a decentralised way close to consumers improving grid strength while reducing expensive transmission and distribution losses. They also contribute to a diverse energy portfolio;
 - Exploit significant natural renewable energy resources - biomass, solar and wind resources remain largely unexploited;
 - Sustainable energy solution - the uptake of renewable energy technology addresses the country's energy needs in a sustainable manner, generating electricity to meet growing demands in a manner which is sustainable for future generations; and
 - Employment creation and other local economic benefits associated with support for a new industry in the South African economy.

The ecological sensitivity of the proposed site development was assessed in full by a specialist (Volume II). The proposed development site surrounding land is currently used for low-intensity grazing which could continue on the site during the construction of the development. The fauna and flora found on the site will not be at significant risk from the development on either vegetation types, namely the Northern Upper Karoo (NKu3) and Besemkaree Koppies Shrubland. Neither vegetation type, both listed as *Least Threatened*, is listed in the National List of Ecosystems that are Threatened and in Need of Protection (GN 1002,2012) published under the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA). Furthermore, according to the National Protected Area Expansion Strategy (NPAES), there is only a small area in the northeast of the study area that has been identified as priority areas for inclusion in future protected areas. Multiple existing power lines already cross this area and as medium to long term lease agreements are in place between land owners and developers, it is unlikely that this area will be incorporated into National Protected Areas in the foreseeable future. The low overall footprint of the development within the ESAs, CBAs and NPAES Focus Areas, combined with the fact that the proposed route runs adjacent to existing power lines for most of the route, the proposed development would not compromise the ecological functioning or the long-term conservation value of the area.

For the DA2S WEF to transfer electricity generated to the national grid, authorisation of the proposed transmission line, and switching station is required. The proposed transmission lines assessed, located within the Central Strategic Transmission Corridor, are approximately between 23 km and 30 km in length and up to 400 kV.

7 ASSESSMENT OF ALTERNATIVES

7.1 Legislative Requirements

In accordance with the requirements of Appendix 1 of the 2014 EIA Regulations (as amended), a BA report must contain a consideration of all alternatives, which can include activity alternatives, site alternatives, location alternatives and the "No Development" alternative. At a minimum, this chapter must address:

- The consideration of the No Development alternative as a baseline scenario;
- A comparison of reasonable and feasible selected alternatives; and
- The provision of reasons for the elimination of an alternative.

Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors. For applications submitted to the DEFF for environmental authorisation in terms of the NEMA, (Act 107 of 1998) and National Environmental Management: Waste Act (NEM:WA, No. 59 of 2008), in respect of listed activities that have been triggered, this project is expected to assess alternative route options, locations, the design and layout of

the development, technologies, operational aspects and the “do-nothing” / “no-go” alternative.

When assessing alternatives, they should be “practical”, “feasible”, “relevant”, “reasonable” and “viable”, and that I&APs should be provided with an opportunity to provide input into the process of formulating alternatives. In this instance, this chapter provides an overview of the alternatives that have been considered for this development.

7.2 Route Alternatives

There are two proposed route alternatives that have been assessed in this report.

Transmission Line Route 1 (Alternative 1– The Preferred Alternative) is approximately 23 km in length. This line will connect the authorised DA2S WEF directly to the existing Eskom Hydra Substation near De Aar, in the Northern Cape Province. The entire proposed route follows and is adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line. From the authorised DA2S WEF on-site substation on the plateau, the proposed line follows a direct route south-west to the existing Eskom Hydra Substation. For approximately 12 km of this route, the proposed line also follows the existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF.

Transmission Line Route 2 (Alternative 2) is approximately 30 km in combined length. This route is split into two parts. Part 1, approximately 5 km in length, runs in a south-easterly direction from the approved solar PV project near De Aar to the existing Eskom Hydra Substation. Part 2, approximately 25 km in length, runs from the authorised DA2S WEF on-site substation to the approved solar PV project. From the DA2S WEF on-site substation, on the plateau, the proposed Part 2 line of Route 2 follows a direct route south-west and is adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line for approximately 20 km. For approximately 8 km of this route, the proposed line also follows the existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF before running in a northerly direction for approximately 5 km to connect to the approved solar PV project.

The specific characteristics of the study area described below, confirms feasibility and motivates that either Alternative is acceptable:

Land Availability and Land Use: In order to develop the transmission line and associated infrastructure, sufficient land is required. Land capability evaluation values range from 1 to 7 across the project area, with the majority of the site falling within the 5 and 6 class range. Agricultural limitations include climatic moisture availability and shallow, stony soils. These factors render the site unsuitable for any kind of mainstream cultivation without irrigation, and limit it to low density grazing only. The proposed development will not affect potential of agriculture in the area; thus, land use is available.

Geographical considerations: The plateau is generally flat rocky outcrops and is covered in typical Karoo scrub and grasses. The eastern end of the proposed transmission line routes climbs steeply to the top of a plateau above the plains at an altitude of 1,500 metres, where the DA2S WEF is located. Below the plateau, the grid connection routes traverse a series of flat valley bottoms divided by intrusive dolerite koppies. These are considered good conditions for the construction of transmission lines.

Sensitive environmental features considerations: Specialist assessed a corridor which was 200 m²² (i.e., 100 m on either side of the proposed transmission lines). The assessment of specialists and review of public data of the study area assisted in buffering and avoiding

²² The aquatic specialist assessed a corridor of 500 m (i.e., 250 m on either side of the proposed transmission lines).

any potential sensitive areas. The EMPr includes mitigation measures, if any specific, for the development.

7.3 Location and Layout Alternatives

The location and layout of the proposed development is considered the most feasible as it is the most direct and the entire site falls within the Central Strategic Transmission Corridor. Furthermore, the switching station will be located in an area authorised for such infrastructure and the proposed transmission lines will follow the existing grid connection transmission routes (of the operational Longyuan Mulilo De Aar 2 North WEF and the existing Eskom Hydra Roodekuil 220 kV transmission line), thus minimising additional impacts as far as possible.

The proposed development is located in an area which has previously been transformed for electrification and infrastructural projects of a similar nature. The placement of similar infrastructure parallel to the existing infrastructure provides an opportunity to consolidate these and creates a cluster of the same infrastructure within an area rather than having it dispersed randomly in the surrounds. This reduces the significance ratings, with mitigation, of the negative impacts to the baseline environment.

The switching station will be located on the plateau, within the authorised DA2S WEF site, alongside the authorised collector substation. The switching station, will have a maximum 100 m x 100 m footprint and will be placed within an assessed area (referred to as the "Switching Station Assessment Area" of approximately 2.8 ha (i.e., approximately 200 m x 140 m)).

The transmission line route corridors, and switching station was provided to the specialists for their impact assessment. The applicant is applying for environmental authorisation of one transmission line route (Alternative 1 – The Preferred Alternative), and switching station.

7.4 Grid Connection Technology Alternatives

The main purpose of the proposed development is to connect the authorised DA2S WEF to the national grid. Note that technologies change on a regular basis and the most reliable, safest and cost-effective technology that is available and that meets industry and Eskom standards will be used. Alternatives are proposed for the type of structures which will support the overhead lines. These may include:

- Concrete or steel monopoles (preferred);
- Guy line supported steel structures (small footprint);
- Freestanding metal lattice towers; or
- Multi-pole structures such as H-towers or K-towers.

Refer to **Plates 7-1 to 7-4** for typical examples of these tower types. All aspects of the grid connection, including powerline and supporting structures, would need to adhere to industry and Eskom standards.



Plate 7-1: Concrete or steel monopoles.



Plate 7-2: Guy line supported steel structures.



Plate 7-3: Freestanding metal lattice towers.



Plate 7-4: Multi-pole structures such as H-towers or K-towers.

Table 7.1: Advantages and Disadvantages of the Grid Connection Alternatives

No.	Alternatives	Advantages / Disadvantages
1	<u>Concrete, steel monopoles structures (preferred)</u>	<ul style="list-style-type: none"> These are the Eskom standard towers Cost-effective Steel monopole is the preferred structure from an avifaunal perspective, and acceptable from a visual perspective
2	<u>Guy line supported steel structures</u>	<ul style="list-style-type: none"> Small footprint Not considered preferable for the proposed application due to theft of members and agricultural aversion due to stay wires
3	<u>Self-Supporting steel lattice towers</u>	<ul style="list-style-type: none"> Not preferred from an avifaunal perspective Not considered preferable for the proposed application due to possible theft of members and cost
4	<u>Multi-pole structures such as H-towers or K-towers</u>	<ul style="list-style-type: none"> Not preferred from an avifaunal perspective Wooden structures are fire hazard and degrade faster Not considered reasonable or feasible for the proposed application

7.5 The No Development Alternative

The 'No Development' scenario assumes that the proposed development does not proceed, implying a continuation of the *status quo*. It is equivalent to the future baseline scenario in the absence of the proposed development.

Relative to this authorisation, the main implication of the 'No Development' scenario is that the proposed development will not be constructed and the authorised DA2S WEF will not have a route to transfer the electricity generated to the existing Eskom Hydra Substation and into the national grid. The result will also include the following:

- There is no change in the current landscape or environmental baseline;
- The grid connection will not contribute to the establishment of transmission lines within the recognised Central Strategic Transmission Corridor;
- The authorised DA2S WEF will not be constructed without the required grid infrastructure and switching station to transfer the electricity generated to the national grid;
- The DA2S WEF will not succeed in the REIPPP, and the potential social economic, and climate change mitigation benefits would not be realised by the WEF and Grid Connection;
- There is less opportunity for additional employment (albeit temporary) in the local area where job creation is identified as a key priority;
- The local Economic Development benefits associated with the development of the DA2S WEF and its associated infrastructure's REIPPPP commitments will not be realised, such as securing local energy production;
- The potential to mitigate climate change impacts on the environment and local species will be limited; and
- The establishment of renewable energy targets on a provincial and national scale will not be realised from this proposed development.

Furthermore, the no-go alternative, as assessed by the avifaunal specialist, is not necessarily the most ecologically attractive alternative with respect to avifauna in the area, as opportunities exist to improve the visibility of existing infrastructure to birds with this proposed development. The no-go alternative is therefore not the preferred alternative from an avifaunal perspective.

7.6 Summary of Alternatives Considered

The 'no-go' alternative is not considered acceptable. The proposed routes are the shortest, most direct and technically feasible route to connect the authorised De Aar 2 South WEF to the existing Eskom Hydra substation, or via an approved solar PV project. In this landscape, described above, one way of minimising impacts to the environment is to reduce the development footprint and size of the development. This has been done by putting forward the shortest feasible route/s for assessment. Furthermore, the switching station will be in an area within the authorised DA2S WEF site, alongside the authorised collector substation.

The proposed development is located within the Central Strategic Transmission Corridor, Northern Cape Province. The applicant is applying for environmental authorisation of one transmission line (Transmission Line Route 1 – The Preferred Alternative), and switching station.

8 DESCRIPTION OF THE PREFERRED ALTERNATIVE

Mulilo requires authorisation of one transmission line route (for up to 400 kV) and a switching station. The corridor assessed was 200 m²³ (i.e., 100 m on either side of the proposed transmission lines). The entire site of the proposed development is located within the Central Strategic Transmission Corridor (Figure 8.1: Proposed Development Plan). A description of the Preferred Alternative is provided below:

Transmission Line Route 1 (Alternative 1– The Preferred Alternative) is approximately 23 km in length. This line will connect the authorised DA2S WEF directly to the existing Eskom Hydra Substation near De Aar, in the Northern Cape Province. The entire proposed route follows and is adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line. From the authorised DA2S WEF on-site substation on the plateau, the proposed line follows a direct route south-west to the existing Eskom Hydra Substation. For approximately 12 km of this route, the proposed line also follows the existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF.

The proposed transmission line will be up to 400 kV line, using either steel monopole or lattice tower structures with maximum heights of 30 m, and will consist of:

- Foundations and insulators;
- Existing access roads and jeep tracks; and
- Line and servitude clearances to meet the statutory requirements.

The applicant has chosen this as the preferred alternative as it connects directly into the Eskom Hydra Substation. Furthermore, specialists have confirmed that authorisation of either / both transmission line routes is acceptable.

Authorisation of an up to 400 kV switching station is also required. The switching station will be located on the plateau, within the authorised DA2S WEF site, alongside the collector substation. The switching station, will have a maximum 100 m x 100 m footprint and will be placed within an assessed area ("Switching Station Assessment Area" of approximately 2.8 ha (i.e., approximately 200 m x 140 m)).

As this application forms part of the Electricity Grid Infrastructure as per GN 113 (Central Strategic Transmission Corridor) (see applicability in Table 8.1 below), the basic assessment procedure contemplated in Regulation 19 and 20 of the EIA Regulations, 2014, is being followed in order to obtain environmental authorisation, as required in terms of the Act.

Table 8.1: Parameters of the GN 113 of February 2018 applicability to the proposed development

No.	Parameters	Applicability to the proposed development
1	The Strategic Environmental Assessment for Electricity Grid Infrastructure (EGI) in South Africa has Identified five Strategic Transmission Corridors that are of strategic importance for the rollout of the supporting large scale electricity transmission and distribution infrastructure in terms of Strategic Integrated Project 10: Electricity Transmission and Distribution	Not applicable
2	On 17 February 2016, Cabinet approved the Strategic Transmission Corridors contained in this Notice, which support areas where long term electricity grid infrastructure will be developed and where an integrated decision-making process for applications for	The entire proposed transmission line falls within the Central Strategic Transmission Corridor.

²³ The aquatic specialist assessed a corridor of 500 m (i.e., 250 m on either side of the proposed transmission lines).

No.	Parameters	Applicability to the proposed development
	environmental authorisation in terms of the National Environmental Management Act, 1998, will be followed.	
3	Applications for an environmental authorisation for large scale electricity transmission and distribution facilities, when such facilities trigger activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014 and any other listed and specified activities necessary for the realisation of such facilities, and where the greater part of the proposed facility is to occur in one or more such Strategic Transmission Corridors, must follow the basic assessment procedure contemplated in Regulation 19 and 20 of the Environmental Impact Assessment Regulations, 2014 in order to obtain environmental authorisation, as required in terms of the Act.	Application is being made for a proposed up to 400 kV transmission line and switching station, which triggers Activity 9 of LN 2 of the EIA Regulations, as amended, and the entire proposed development falls within the Central Strategic Transmission Corridor.
4	The timeframe for decision making as contained in the Environmental Impact Assessment Regulations, 2014 for purposes of the applications for environmental authorisation contemplated in this Notice is 57 days.	As parameters are met in the GN 113, this proposed development should receive decision from the competent authority within 57 days.
5	For applications for environmental authorisation for large scale electricity transmission and distribution facilities contemplated in paragraph 3, routes that have been pre-negotiated with landowners must be submitted as part of such application for environmental authorisation.	Pre-negotiated routes as agreed with landowners which the proposed development traverses was submitted with the application form to the DEFF.
6	Applications for environmental authorisation for large scale electricity transmission and distribution facilities, where the greater part of the facility falls outside a Strategic Transmission Corridor, will be considered in line with the requirements prescribed in terms of the Environmental Impact Assessment Regulations, 2014	The entire proposed transmission line falls within the Central Strategic Transmission Corridor.
7	If the greater part of the facilities contemplated in this Notice falls outside a Strategic Transmission Corridor contemplated in this Notice, the requirements as prescribed In the Environmental Impact Assessment Regulations, 2014, apply.	The entire proposed transmission line falls within the Central Strategic Transmission Corridor.

9 ASSESSMENT OF POTENTIAL IMPACTS

The focus and defining question of each potential impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or future production of the baseline environment. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or future production of the baseline environment.

This chapter describes the potential impacts assessed during each phase, and the cumulative assessment is reflected in Chapter 10. A table which shows the potential impacts which specialists assessed for each phase is included in the Executive Summary.

9.1 Soil

For agricultural impacts, the exact nature of the different infrastructure technologies within the facility has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land, and whether it is being occupied by a pylon foundation or a switching station makes no difference. What is of most relevance therefore is simply the total footprint of the facility.

It is anticipated that there will be minimal disturbance to the land during construction and decommissioning, resulting in soil degradation impacts of low significance.

9.1.1 Construction and Decommissioning Phases

Impact Phase: Construction & Decommissioning Phase							
Potential impact description: Soil degradation							
Soil degradation can result from erosion and topsoil loss. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance and vegetation removal. Loss of topsoil can result from poor topsoil management during construction related soil profile disturbance. Soil degradation will reduce the ability of the soil to support vegetation growth.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	M	Negative	M	M	H
With Mitigation	L	M	L	Negative	L	L	H
Can the impact be reversed?			Soil degradation can be reversed only to some extent and only with substantial inputs over a significant period of time.				
Will impact cause irreplaceable loss of resources?			No, because a very small amount of grazing land is impacted and such land is not a scarce resource.				
Can impact be avoided, managed or mitigated?			Yes, see below.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Implement an effective system of storm water run-off control using bunds and ditches, where it is required - that is at all points of disturbance where water accumulation might occur. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.• Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.• If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.							

9.2 Aquatic

The following direct impacts were assessed with regard to the riparian areas and watercourses based on the two proposed routes.:

- Impact 1: Loss of riparian systems and disturbance of the alluvial watercourses
- Impact 2: Impact on riparian systems through the possible increase in surface water runoff on riparian form and function
- Impact 3: Increase in sedimentation and erosion
- Impact 4: Potential impact on localised surface water quality
- Impact 5: Cumulative impacts for the overall project due to the high number of projects surrounding this application

The following impacts were not assessed as these were found not applicable:

- Loss of species of special concern – no listed or protected aquatic species were found during the assessment
- Loss of any wetlands – the only natural wetland observed could be avoided by the strategic placement of towers

The potential impact on aquatic species of special concern was not assessed, as no listed or protected species were observed during the assessment. Similarly, the loss of any natural wetlands did not require assessment as the only system observed could be spanned easily.

9.2.1 Construction, Operation and Decommissioning Phases

Impact Phase: All Phases							
<p>Potential impact description: Loss of riparian system, wetlands and disturbance of the alluvial watercourses</p> <p>Should any of the proposed structures associated with the transmission line be placed within the delineated watercourse, a physical loss of associated vegetation as well damage to the bed and banks of the observed systems could occur. Although true aquatic obligate vegetation was seldom seen, any disturbance of these areas could result in disturbance of the systems resulting in erosion / sedimentation, loss of habitat and corridor (Ecological Support Area) fragmentation.</p> <p>These disturbances will be the greatest during the construction and again in the decommissioning phases as the related disturbances could result in loss and/or damaged vegetation, while to a lesser degree in the operation phase (i.e., as and when maintenance occurs).</p>							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	M	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes – through removal of hard surfaces and careful reinstatement of natural ground levels coupled to revegetation				
Will impact cause irreplaceable loss or resources?			No – significant water courses remain within the greater catchment				
Can impact be avoided, managed or mitigated?			Yes – refer to mitigations below				
<p>Mitigation measures to reduce residual risk or enhance opportunities:</p> <ul style="list-style-type: none">• A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled with micro-siting of the final tower layout as required.• The planning of the final layout should consider the aquatic sensitivity areas, to avoid these areas or where access is required, cross such areas using existing tracks / roads or where the impacts would be low or can easily be mitigated.• Due to the broad nature of the alluvial systems, towers would need to be placed in some of these areas, but it is recommended that no new permanent tracks to access these areas are created.• Vegetation clearing, where required, should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off.• It is also advised that an Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas within aquatic environment, using selected species detailed in this report.• All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. Prosopis (alien invasive riparian tree) is prevalent in areas to the north of the site, thus care in transporting any material, while ensuring that such materials is free of alien seed, coupled with pre and post alien clearing must be stipulated in the EMPr.							

Impact Phase: All Phases
<p>Potential impact description: Increase in sedimentation and erosion within the development footprint</p> <p>Impacts include changes to the hydrological regime such as alteration of surface run-off patterns, runoff velocities and or volumes which could occur during the construction, operational and decommissioning phases.</p>

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	M	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes – through removal of hard surfaces and careful reinstatement of natural ground levels coupled to revegetation				
Will impact cause irreplaceable loss or resources?			No – significant water courses remain within the greater catchment				
Can impact be avoided, managed or mitigated?			Yes – refer to mitigations below				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Any stormwater within the site must be handled in a suitable manner, i.e., trap sediments and reduce flow velocities.Any management actions must be dealt with in the Stormwater Management Plan (SWMP), forming part of any Water Use License Application, to the Department of Human Settlements, Water and Sanitation (DHSWS)							

Impact Phase: All Phases							
Potential impact description: Impact on localised surface water quality During construction / decommissioning and to a limited degree the operational activities, chemical pollutants (hydrocarbons from equipment and vehicles, cleaning fluids, cement powder, wet cement, shutter-oil, etc.) associated with site-clearing machinery and construction or maintenance activities could be washed downslope via the ephemeral systems.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	L	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes = through typical measures associated with the cleanup of spills				
Will impact cause irreplaceable loss or resources?			No – due to limited flows within these systems				
Can impact be avoided, managed or mitigated?			Yes – see mitigations below				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">• Strict use and management of all hazardous materials used on site in line with the specific material safety data sheets, e.g., fuels must be stored within a contained / bunded site with the necessary and spill kits available.• Strict management of potential sources of pollution (e.g., litter, hydrocarbons from vehicles & machinery, cement during construction, etc.).• Containment of all contaminated water by means of careful run-off management on the development site.• Appropriate ablution facilities should be provided for construction workers during construction and on-site staff during the operation of the facility.• Strict control over the behaviour of construction workers, with regard littering, use and storage of chemicals.• Working protocols incorporating pollution control measures (including approved method statements by the contractor) should be clearly set out in the Environmental Management Programme (EMPr) for the project and strictly enforced.							

9.2.2 Operation and Decommissioning Phases

Impact Phase: Operation and Decommissioning

Potential impact description: Impact on aquatic systems through the possible increase in surface water runoff on downstream riparian form and function, due to impacts to the hydrological regime such as alteration of surface run-off patterns.

When any of the hard or compacted surfaces (roads or substation areas) increase the volume and velocity of the surface runoff increases. This could impact the hydrological regime through the increase in flows that are concentrated in area, and as most plants are drought tolerant an increase in water will allow for other species to develop and outcompete typical plant species found within the region. This then affects the structure (i.e., larger taller grasses / shrubs / trees) and function (greater attenuation of flows, restricting any runoff from reaching downstream areas). The opposite can also happen. If flows are too concentrated with high velocities, scour and erosion results, with a complete reduction or disturbance of riparian habitat.

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	M	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes – through removal of hard surfaces and careful reinstatement of natural ground levels coupled to revegetation				
Will impact cause irreplaceable loss or resources?			No – significant water courses remain within the greater catchment				
Can impact be avoided, managed or mitigated?			Yes – refer to mitigations below				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Any stormwater within the site must be handled in a suitable manner, i.e., trap sediments, and reduce flow velocities.No stormwater runoff must be allowed to discharge directly into any water course along roads, and flows should thus be allowed to dissipate over a broad area covered by natural vegetation.Stormwater in the switching station must be managed using appropriate channels and swales when located within steep areas or have steep embankments.							

9.3 Terrestrial Ecology

Potential impacts on the terrestrial ecology of the study area include the following:

- Impacts on biodiversity: Any impacts on populations of species of concern (flora and fauna) and on overall species richness, genetic variability, population dynamics and habitats important for species of concern;
- Impacts on sensitive habitats: Impacts on any sensitive or protected habitats, including indigenous grassland and wetland vegetation that leads to direct or indirect loss of such habitat;
- Impacts on threatened ecosystems: Any impacts on threatened or protected ecosystems, critical biodiversity areas, areas of high biodiversity and centres of endemism;
- Impacts on ecosystem functions: Any impacts on processes or factors that maintain ecosystem health and character, including the following:
 - Habitat fragmentation;
 - Disruption to ecological corridors;
 - Changes to abiotic environmental conditions;
 - Changes to disturbance regimes, e.g., increased or decreased incidence of fire;
 - Disruption to nutrient-flow dynamics;
 - Impedance of movement of material or water;
 - Changes to successional processes;
 - Effects on pollinators; and
 - Increased invasion by alien plants.

9.3.1 Construction Phase

As the two vegetation types on the project site classified nationally as Least Threatened, are largely contiguous and cover extensive areas, the probability that the clearing associated with the proposed development will contribute to fragmentation or have a negative impact on the long-term viability and persistence in the area is low, and therefore the impact significance is low following mitigation measures such as the avoidance of areas of elevated sensitivity and maximized utilisation of existing servitudes.

Impact Phase: Construction							
Potential impact description: Loss of fragmentation of indigenous natural vegetation Impact on vegetation through the destruction of plants from construction activities, some areas cleared for permanent infrastructure will persist for the long-term. Power line tower structures will affect relatively small, localised areas of vegetation. Access roads may affect slightly larger areas, however as the proposed route is immediately adjacent to an existing powerline the existing access road infrastructure can be utilised to reduce this impact. The switching station will result in the clearing of an area of up to 100mx100m.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	H	Negative	M	L	H
With Mitigation	L	H	M	Negative	L	L	H
Can the impact be reversed?			No. Some long-term loss of vegetation is likely.				
Will impact cause irreplaceable loss or resources?			No. The vegetation is widespread in the area and the size of the project footprint is comparatively low.				
Can impact be avoided, managed or mitigated?			Partly. Some residual impact is likely; however, the intensity of the impact can be reduced through mitigation.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Pylon tower footprints to be constructed outside of HIGH sensitivity areas (although the line spans may cross these areas);• Preconstruction walk-through of the power line development footprints (pylon bases, new servitudes, lay-down areas and temporary infrastructure) once finalised for micro-siting to ensure that sensitive habitats are avoided where possible;• Ensure that lay-down and other temporary infrastructure are within MEDIUM or LOW sensitivity areas;• Minimise the development footprint as far as possible and rehabilitate disturbed areas that are not required by the operational phase of the development;• Utilize existing servitudes and access roads wherever possible, any new roads or the upgrading of roads should be minimized as far as possible and not be larger than required;• All construction vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;• Ensure that sufficient erosion control measures are constructed on all servitudes and access roads in the project area;• Rehabilitate existing servitude and access roads in the project area with sufficient erosion control measures to prevent the loss of soil and the degradation of vegetation;• An environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as avoiding fire hazards, no littering, appropriate handling of pollution and chemical spills, minimizing wildlife interactions, remaining within demarcated construction areas, avoidance of no-go areas and sensitive habitats (i.e., wetlands);• Demarcate sensitive areas in close proximity to the development footprint as no-go areas with construction tape or similar and clearly marked as no-go areas;• No open fires should be permitted outside of designated areas;• Construction activities in or near drainage lines, washes or temporary inundated depressions (as indicated by MEDIUM sensitivity areas on the map) must only take place during the dry season;• An environmental management programme (EMPr) must be implemented, and must provide a detailed description of how construction activities must be conducted to reduce unnecessary destruction of habitat.							

None of the plant species recorded on site were listed as protected by NEMBA. However, several species identified on the project site are protected under the Northern Cape Nature Conservation Act. One tree species, the Shepherd's Tree is protected under the National Forest Act. However, this species was not recorded to be present on the study site during the ecological survey. While the loss of some individuals of protected plants is possible, the probability that the loss of some individuals will have a negative impact on the viability or persistence of species in the area is low given that many of the species are locally common and widespread and the vegetation types in the area are largely intact, therefore this impact is considered to be of low significance following the implementation of mitigation measures such as maximizing the utilisation of existing servitudes.

Impact Phase: Construction							
Potential impact description: Loss of individuals of threatened or protected plant species Loss or damage of threatened or protected plant species through construction activities. The illegal collecting of plant species may increase if access to the site is increased during construction activities.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	H	Negative	M	L	H
With Mitigation	L	H	M	Negative	L	L	H
Can the impact be reversed?			No. Some permanent loss of plants is likely.				
Will impact cause irreplaceable loss or resources?			No. The species are widespread in the area and the size of the project footprint is comparatively low.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">• Preconstruction walk-through of the power line development footprints (pylon bases, new servitudes, lay-down areas and temporary infrastructure) once finalised for micro-siting to ensure that protected species are avoided where possible;• Compile a comprehensive species list of plants that may be cut, chopped, uprooted, broken, damaged or destroyed and obtain relevant permits for these restricted activities;• Utilize existing servitudes and access roads wherever possible, any new roads or the upgrading of roads should be minimized as far as possible and not be larger than required;• All construction vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;• Site access should be controlled and no unauthorised persons should be allowed onto the site;• The collection or harvesting of any plants at the site should be strictly forbidden;• Personnel should not be allowed to wander off the demarcated construction site; and• An environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to.							

This impact includes the temporary loss of faunal habitat and refugia associated with laydown areas and temporary contractor's facilities as well as the permanent loss associated with the construction of permanent structures such as the switching station. The risk to habitats also includes pollution and contamination, particularly wetland and aquatic environments, from construction activities (e.g., oil leaks or chemical spills). While the loss of some habitat during construction is inevitable, the probability that the clearing associated with the proposed development will have a negative impact on the faunal populations in terms of their long-term viability and persistence in the area is low, and therefore the impact significance is low. These impacts can be further reduced following the implementation of mitigation measures.

Impact Phase: Construction							
Potential impact description: Loss of faunal habitat and refugia Loss or damage of faunal habitat and refugia such as burrow systems and temporary vleis/wetlands due to construction activities. The damage to faunal habitat (especially aquatic environments) due to increased erosion and contamination form chemical leaks/spills. Some of these potential impacts can persist into the long-term if not appropriately mitigated against.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	H	Negative	M	L	H
With Mitigation	L	H	M	Negative	L	L	H
Can the impact be reversed?			Partially. Some habitats such as temporary vleis can be artificially constructed, however loss due to contamination is more difficult to reverse.				
Will impact cause irreplaceable loss or resources?			No. Habitats available on the project site are widespread in the area.				
Can impact be avoided, managed or mitigated?			Yes, the probability and intensity of this impact can be reduced through mitigation.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Preconstruction walk-through of the power line development footprints (pylon bases, new servitudes, lay-down areas and temporary infrastructure) once finalised for micro-siting to ensure that temporary vleis/wetlands and burrow systems are avoided where possible;• No construction of pylon towers in HIGH sensitivity areas;• Ensure that lay-down and other temporary infrastructure are within MEDIUM or LOW sensitivity areas;• No-go areas around sensitive habitats such as wetlands or burrow systems should be clearly marked;• All construction vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;• Ensure that sufficient erosion control measures are constructed on all servitudes and access roads in the project area;• Rehabilitate existing servitude and access roads in the project area with sufficient erosion control measures to prevent the loss of soil and the degradation of vegetation;• All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill;• Utilize existing servitudes and access roads wherever possible, any new roads or the upgrading of roads should be minimized as far as possible and not be larger than required; and• All construction vehicles should adhere to clearly defined and demarcated roads, off-road driving should be avoided.							

The probability of direct faunal mortalities associated with construction activities having a negative impact on the viability of terrestrial animal populations persisting in the area over the long term is low given the small scale of the development footprint relative to the largely undisturbed habitat available in the surrounding area, therefore this impact is considered to be of low significance. The impact can be further reduced following the implementation of mitigation measures.

Impact Phase: Construction							
Potential impact description: Direct impact to fauna Direct impact to fauna caused by construction activities, such as increased risk of injury or mortality from collision with vehicles due to increased traffic, the increased possibility of illegal hunting, poaching, persecution or harvesting of fauna.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence

Without Mitigation	L	L	H	Negative	L	L	H
With Mitigation	L	L	M	Negative	L	L	H
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			Potentially. If rare or threatened species suffer direct mortality.				
Can impact be avoided, managed or mitigated?			Yes, the probability and intensity of this impact can be reduced through mitigation.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Construction of infrastructure in or near aquatic environments (as indicated by medium sensitivity on figure 11.1 and 11.1a-d) must be conducted during the dry season;• All construction vehicles should adhere to clearly defined and demarcated roads, off-road driving should be avoided;• All construction vehicles on the proposed development site should adhere to a low speed limit (30km/h) to avoid collisions with susceptible species. On public roads, legislated applicable speed limits must be strictly adhered to;• Night driving must be avoided where possible;• Site access should be controlled and no unauthorised persons should be allowed onto the site;• All personnel should undergo an initial environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes or tortoises;• The illegal collection, hunting or harvesting of animals at the site should be strictly forbidden;• No animals such as dogs or cats to be allowed on site other than those of the landowners;• Personnel should not be allowed to wander off the construction site;• No open fires should be permitted outside of designated areas;• Any fauna directly threatened by the construction activities should be removed to a safe location by the environmental control officer or other suitably qualified person.							

Increased levels of noise and disturbance by vehicles, machinery and human presence during construction will likely impact sensitive species causing them to move away from the project site potentially influencing movement, foraging activity, breeding and impacting energy budgets. As large areas of contiguous natural habitat are available, the displacement distance would not be excessively far and as the impact is only for a relatively short period of time. Therefore, probability that disturbance or displacement of fauna associated with the construction of the proposed development will have a negative impact on the faunal populations in terms of their long-term persistence and viability in the area is low, and therefore the impact significance is low. These impacts can be further reduced following the implementation of mitigation measures.

Impact Phase: Construction							
Potential impact description: Displacement or disturbance of fauna due to increased activity and noise levels The displacement or disturbance of fauna due to construction activities. Species sensitive to human activity such as reedbeak would likely move away from construction activities.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	L	L	Negative	L	L	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?	Yes. The disturbance resulting from construction activities will be transient in nature.						
Will impact cause irreplaceable loss or resources?	No. Most species would be able to move away from disturbance, large areas of natural habitat available means displacement distance would not be excessively far.						

Can impact be avoided, managed or mitigated?	Partly, noise and activity cannot be entirely avoided or mitigated against.
<p>Mitigation measures to reduce residual risk or enhance opportunities:</p> <ul style="list-style-type: none"> Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate to reduce the disturbance and foraging activities of nocturnal species; The movement of construction personnel should be restricted to the construction areas on the project site; Speed limits should be strictly enforced to reduce unnecessary noise and dust; and No dogs or cats other than those of the landowners should be allowed on site as these animals cause unnecessary disturbance such as chasing fauna. 	

9.3.2 Operation Phase

Direct mortality through road fatalities is a risk to many animal species during routine operational activities. The position of the proposed grid connection adjacent to existing power lines makes it unlikely that the proposed development will significantly increase the probability of collisions for species of conservation concern beyond that which already exists on the site. Following the implementation of mitigation measures the impacts of direct mortality from the proposed development during the operation phase can be reduced to acceptable levels and the development is unlikely to threaten the long-term viability or persistence of species in the area. The post-mitigation impact significance is therefore likely to be low.

Impact Phase: Operation							
Potential impact description: Direct faunal impacts Disturbance, direct mortality through collision and illegal collecting or poaching of fauna.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	H	Negative	L	L	H
With Mitigation	L	M	M	Negative	L	L	H
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			Potentially. If rare or threatened species suffer direct mortality.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">• All vehicles should adhere to a low-speed limit (30km/h) to avoid collisions with susceptible species;• General maintenance should be conducted during the dry season where possible;• Speed limits must apply within the project site as well as on the public gravel access roads to the site;• Night driving must be avoided where possible;• Site access should be controlled and no unauthorised persons should be allowed onto the site;• All personnel should undergo an initial environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes or tortoises;• The illegal collection, hunting or harvesting of animals at the site should be strictly forbidden; and• No animals such as dogs or cats to be allowed on site other than those of the landowners.							

The clearing and disturbance of areas during the construction phase of the project can result in an increased and ongoing risk of invasion of alien plant species, particularly pioneer species, along the power line route and underneath pylon towers during the operational phase. Regular alien clearing activities would be required, particularly during the initial stages of the operational phase to limit the spread of alien species. Once the natural vegetation has re-established in previously disturbed areas then the level of alien control required would likely be reduced.

Impact Phase: Operation							
Potential impact description: Alien plant invasion Clearing and disturbance from construction activities leaves areas along the power line route susceptible to invasion by alien plant species.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	H	Negative	M	M	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">Disturbed areas such as road verges, lay-down areas and areas utilised by temporary construction facilities must be regularly monitored to detect the establishment of alien species and those species should be eradicated before they spread;Regular alien clearing should be conducted, as needed, using the best-practice methods for the species concerned, the use of herbicides should be avoided as far as possible; andThe use of herbicides (if absolutely required) for the control and eradication of alien grasses should be done in accordance with an alien eradication programme to reduce unintended ecological impacts.							

Disturbance created during construction would leave the disturbed areas vulnerable to soil erosion. Consequently, specific measures such as erosion berms and water dispersion features will be required along the power line access roads and servitudes. Although this impact has a moderate significance before mitigation, it can be effectively mitigated against through the maximum use of existing access roads and servitudes and the implementation of erosion control measures. The significance of this impact after the implementation of mitigation measures is therefore considered to be low.

Impact Phase: Operation							
Potential impact description: Soil Erosion Risk Following construction, the site will be vulnerable to soil erosion.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	M	Negative	M	H	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			No. Once erosion takes place some irreversible damage occurs.				
Will impact cause irreplaceable loss or resources?			Yes. Without mitigation the loss of topsoil would result in an irreversible loss of resources.				
Can impact be avoided, managed or mitigated?			Yes. Erosion control measures can be very effective.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">Erosion management at the site should take place according to the EMPr;All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate energy in the water stream which may pose an erosion risk;Existing servitudes and access roads along the existing, adjacent power line must be utilised wherever possible;							

- Existing servitudes and access roads along the existing, adjacent power line must be upgraded with appropriate and effective erosion control measures; and
- Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.

9.4 Avifauna

Many existing power lines traverse the area and therefore most of the potential impacts already exist in and around the project site. The majority of the proposed power line routes are adjacent to existing power lines.

The proposed power line routes traverse or pass near several important habitats for avifauna, including grassy plains (important for cranes, bustards and korhaans), rocky ridges (important for raptors) as well as various wetlands, rivers and dams (important for waterbirds and cranes). Particular attention has been given to the potential impact on Ludwig's Bustard in this assessment as some areas around the project site are known to be important breeding and lekking²⁴ grounds. Other important collision prone species in the area are also the Blue Crane and Secretary Birds. While the project site is not directly within these areas, the species may be impacted upon while traversing the project site to and from these areas.

The key potential impacts on avifauna associated with power line and grid connection infrastructure (i.e., switching station) include:

- Displacement of priority or Red Data avifauna due to habitat destruction and transformation;
- Displacement of avifauna due to disturbance;
- Mortality of priority or Red Data avifauna due to collisions; and
- Mortality of priority or Red Data avifauna due to electrocution.

9.4.1 Construction Phase

Sections of natural habitat will be destroyed during the construction phase for clearing of servitudes, creation of access roads and for clearing of pylon bases, lay-down areas and temporary construction facilities. Clearing these areas will have an impact in terms of loss of habitat for avifauna. Approximately 1 ha of land associated with the proposed switching station will be cleared, as the vegetation type associated with the switching station assessment area is largely intact, the impact is considered to be of low significance. Pylon bases have a relatively small footprint and therefore do not pose a significant impact of habitat loss. The use of existing access roads and servitudes associated with the adjacent, existing power line will significantly reduce the impact associated with the proposed development, as the total area of natural habitat that needs to be cleared will be relatively small. Most of the novel clearing will therefore be transient in nature and for a short duration, as recovery will take place once the construction phase is completed.

While the clearing of some habitat during construction is inevitable, the probability that the clearing associated with the proposed development will have a negative impact on the avifaunal populations in terms of their long-term viability and persistence in the area is low, as the area surrounding the project site is widespread, contiguous and largely untransformed natural habitat, therefore the impact significance is low. These impacts can be further reduced following the implementation of mitigation measures.

Impact Phase: Construction

Potential impact description: Habitat destruction

²⁴ Allan DG: Ludwig's Bustard. In Roberts Birds of Southern Africa. 7th edition. Edited by: Hockey PAR, Dean WJR, Ryan PG. Trustees of the John Voelcker Bird Book Fund, Cape Town; 2005:293–294.

Habitat loss associated with the clearing of vegetation for lay-down areas, temporary construction facilities and pylon bases.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Negative	L	L	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Mostly. Destruction of habitat will largely be transient in nature.				
Will impact cause irreplaceable loss of resources?			No. The habitats on site are widespread and the footprint of the power line pylons is relatively small.				
Can impact be avoided, managed or mitigated?			Mostly. The use of existing servitudes will mitigate most of the residual impact.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Existing roads and servitudes to be used wherever possible;Avifaunal specialist must be appointed to conduct a walkthrough of the pylon positions;Minimise the development footprint as far as possible and rehabilitate disturbed areas that are not required by the operational phase of the development such as lay-down areas and temporary construction facilities;No construction activity must occur within seasonally inundated areas during the peak rainfall period in summer to reduce the potential impact on wetland habitats;All construction vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;No open fires should be permitted outside of designated areas.							

The probability of significant disturbance and displacement occurring is reduced by adhering to mitigation measures such as appropriate timing of construction activities near sensitive sites, such as the Verreaux's Eagle nest. The displacement of avifauna by construction activities associated with the proposed development is therefore considered to be of low significance if mitigation measures are adhered to.

Impact Phase: Construction							
Potential impact description: Disturbance and Displacement							
Displacement of priority species, particularly Red Data species, due to disturbance associated with construction activities.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	L	M	Negative	M	H	H
With Mitigation	L	L	L	Negative	L	L	H
Can the impact be reversed?			Yes. Disturbance associated with construction is transient in nature and the impact will cease once construction has been completed.				
Will impact cause irreplaceable loss of resources?			No. Avifaunal communities will recolonize the area once construction has been completed.				
Can impact be avoided, managed or mitigated?			Yes. The probability and intensity of disturbance can be reduced with mitigation measures.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• No construction activities within 500 m of the identified Verreaux's Eagle nest (-30.595564, 24.265331) should proceed during the breeding season (i.e., May, June; July and August);• No construction activities or personnel should be permitted to enter the 300 m no-go nest buffer around the identified Verreaux's Eagle nest at any time;• Maximum use of existing access road and servitudes;• No off-road driving;• Speed limits (30 km/h) should be strictly enforced to reduce unnecessary noise;							

- Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate;
- The movement of construction personnel should be restricted to the construction areas on the project site;
- No dogs or cats other than those of the landowners should be allowed on site;
- Any holes dug e.g., for foundations of pylons should not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter;
- An appointed Environmental Control Officer (ECO) must be trained by an avifaunal specialist to identify the potential priority species as well as the signs that indicate possible breeding by these species;
- The ECO must make a concerted effort to look out for such breeding activities especially of Red Data species; and
- If any Red Data species are confirmed to be breeding (e.g., if a nest site is found), construction activities within 500m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.

9.4.2 Operation Phase

Periodic maintenance is required of the servitude and power line infrastructure, including the regular clearing of excess vegetation to allow for unrestricted movement along the service and access roads and to minimize the risk of fires. The power line may also require aerial inspection or maintenance. The disturbance of avifauna during the operational phase, while ongoing, is not continuous and is therefore considered to be of low significance if mitigation measures are adhered to.

Impact Phase: Operation							
Potential impact description: Disturbance and Displacement Displacement of priority species, particularly Red Data species, due to disturbance associated with operational activities such as line assessment and maintenance.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	M	Negative	M	H	High
With Mitigation	L	M	L	Negative	L	L	High
Can the impact be reversed?			Yes. Birds will move back into the area after a disturbance event.				
Will impact cause irreplaceable loss of resources?			No.				
Can impact be avoided, managed or mitigated?			Yes. The probability and intensity of disturbance can be reduced with mitigation measures.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Aerial assessment or maintenance of the power line (e.g., by helicopter) should not be conducted around the Verreaux's Eagle nest during the breeding season (May, June, July and August) where possible;• All vehicles should adhere to clearly defined and demarcated roads, no off-road driving should be allowed;• Speed limits (30 km/h) should be strictly enforced to reduce unnecessary noise;• The movement of personnel should be restricted to the servitudes and access roads on the project site;• No dogs or cats other than those of the landowners should be allowed on site; and• No-go areas should be adhered to.							

The proposed power line route largely runs adjacent to an existing power line. The existing power line is not marked by flappers or bird flight diverters. The proposed power line presents an opportunity to increase the visibility of the existing power line and potentially reduce collisions of heavy-bodied birds such as bustards. The installation of flappers and bird flight diverters (BFDs) may therefore effectively increase the visibility of both the proposed and the existing power lines. Similarly, should it be feasible to stagger the pylons of the proposed power line in relation to the existing power line this may also increase the visibility to birds susceptible to power line collision.

The pair of Verreaux's Eagle associated with the nest in the north-east of the power line corridor are presumably at a low risk of collision with the existing power line due to their familiarity with it. They would, however, potentially be at risk of collision with the new power line as it will be unfamiliar to them. The fledglings of each season would potentially be at risk while learning to fly if the proposed power line was placed too close to the nest. It is therefore recommended that the proposed power line be placed to the east of the existing power line as a mitigation measure to reduce the risk of collision.

The collision of avifauna with power lines is considered to be of moderate significance, even with the implementation of mitigation measures which reduces the probability of the impact.

Impact Phase: Operation							
Potential impact description: Collision of birds with power lines. Collisions with large (>132 kV) power lines are a well-documented threat to avifauna in southern Africa ²⁵ while smaller lines pose a higher threat of electrocution but can still be responsible for collision. Collisions with overhead power lines occur when a flying bird does not see the cables, or is unable to take effective evasive action, and is killed by the impact or impact with the ground. Especially heavy-bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability are susceptible to this impact ²⁵ . Species that may be particularly affected on the proposed development site include Ludwig's Bustard, Kori Bustard, Karoo Korhaan and Northern Black Korhaan. Ludwig's Bustard and Kori bustard are known to be particularly prone to collision ²⁶ . Raptors are also susceptible to collisions, a record of Verreaux's Eagle mortality has also been attributed to collision with power lines in the area (EWT data, recorded in 2005).							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	H	Negative	M	H	H
With Mitigation	M	M	H	Negative	M	M	M
Can the impact be reversed?			No. Some collisions by Red Data species are likely.				
Will impact cause irreplaceable loss of resources?			Potentially. The wider area is important for the conservation of some Red Data species.				
Can impact be avoided, managed or mitigated?			Partially. Flappers and other bird flight diverters are not 100% effective at preventing collisions.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• The proposed power line is to be constructed to the east of the existing power line, if technically feasible to do so, to reduce the risk of collision by the breeding pair of Verreaux's Eagle and their fledglings;• There is opportunity to potentially reduce the risk of collision associated with the both the existing line and the new line by attaching flappers and bird flight diverters (BFDs) to the proposed line, as the existing line does not have any attached to it;• The most appropriate and up-to-date marking devices (such as flappers and BFDs) must be selected in consultation with the Endangered Wildlife Trust (EWT);• Attach appropriate marking devices on all spans of all new power lines in accordance with installation guidelines to increase visibility;• Flappers and BFDs must be maintained and replaced where necessary, for the life span of the project;• An operational monitoring programme must be implemented and include regular monitoring (i.e., quarterly) of the entire length of the power lines for collision incidents for the lifespan of the project;• Collision incidents must be recorded and reported to the Endangered Wildlife Trust EWT; and• The potential to stagger pylon towers in relation to the existing power line should be investigated as this may increase the visibility of both existing and new power lines to heavy-bodied flying birds such as bustards.							

²⁵ van Rooyen, C.S. 2004. The Management of Wildlife Interactions with over-headlines. In The fundamentals and practice of Over-head Line Maintenance (132kV and above), pp217-245. Eskom Technology, Services International, Johannesburg.

²⁶ Shaw J, Reid T, Shutgens MG, Jenkins AR & Ryan PG. 2018. High power line collision mortality of threatened bustards at a regional scale in the Karoo, South Africa. Ibis 160:431-446 doi:10.1111/ibi.12553.

Even with the implementation of mitigation measures which reduces the probability of the impact, the significance remains moderate with mitigation.

Impact Phase: Operation							
Potential impact description: Electrocuting of avifauna by powered infrastructure. Overhead power line infrastructure with a capacity of 132 kV or more do not generally pose a risk of electrocution due to the large size of the clearances between the electrical infrastructure components. Electrocutions are therefore more likely for larger species whose wingspan is able to bridge the gap such as eagles or vultures. Various large raptors (such as Martial Eagle, Verreaux's Eagle and potentially vultures), susceptible to electrocution (particularly in the absence of safe and mitigated structures) may occur in the broader project area.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	H	Negative	L	L	H
With Mitigation	M	M	H	Negative	L	L	H
Can the impact be reversed?			No. Some electrocution of priority or Red Data species is possible.				
Will impact cause irreplaceable loss of resources?			Potentially. Electrocution of Red Data species is possible.				
Can impact be avoided, managed or mitigated?			Yes. The probability and intensity of electrocution can be reduced with mitigation measures.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">• The pylons to be constructed must be 'bird friendly' and provide a safe and suitable perch;• The pylons to be constructed must have bird deterrent devices mounted on relevant parts of the structure where necessary to reduce the chances of electrocution;• The pylons to be constructed must be approved by the EWT's Wildlife and Energy Programme;• An operational monitoring programme must be implemented and include regular monitoring (i.e., quarterly) of the of the entire length of the power lines for electrocution incidents for the lifespan of the project (this can be done simultaneously with the collision monitoring); and• Any mortalities must be reported to the EWT.							
Impact to be addressed/ further investigated				Yes. Final design of the pylons must be approved by the EWT.			

9.5 Heritage, Archaeology and Palaeontology

During the construction of the grid connection and associated infrastructure the following physical impacts to the landscape and any heritage resources that lie in or on it can be expected:

- Excavations to construct the foundations for each pylon;
- Levelling of the ground for pylons located on hillsides;
- Construction of roads or tracks to service both the installation of the powerline and its longer-term maintenance;
- Creation of working and lay-down areas for the installation of the pylons;
- Introduction of vehicles, machinery and people into environment; and
- Lastly, the introduction of a substantial industrial feature can have an impact on the cultural landscape.

9.5.1 Construction Phase

Impact Phase: Construction							
Potential impact description: Impacts to archaeological sites and materials							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence

Without Mitigation	L	H	L	Negative	M	H	H
With Mitigation	L	H	L	Neutral/ Positive	L	L	H
Can the impact be reversed?			No, impacts to archaeological resources cannot be reversed, but can be mitigated.				
Will impact cause irreplaceable loss or resources?			No, the archaeological occurrences recorded are well represented in other areas and provided the recommended mitigation measures are implemented, there should be no irreplaceable loss of resources.				
Can impact be avoided, managed or mitigated?			Yes, impacts can be avoided or mitigated through the implementation of the mitigation measures listed below.				
Mitigation measures:							
General:							
<ul style="list-style-type: none">Do not disturb any old stone kraals or ruins and do not remove stone from walls, or artefacts from the earth. If such disturbance is required for construction of the project, then ensure that appropriate permits are obtained from SAHRA or the authority at the time of construction.Report any chance discoveries of human remains to an archaeologist or a heritage authority.							
Specific:							
<ul style="list-style-type: none">Three archaeological sites require mitigation, in the form of artefact mapping, recording and collection by the archaeologist prior to the commencement of construction of the grid connections. These are:<ul style="list-style-type: none">JG050-JG052 / GEB013-GEB014;JG067-JG072 / GEB025; andJG077.The following sites, each with the buffer described below, must be considered no-go areas during construction activities and those nearest the route alignments must be clearly marked as out of bounds:<ul style="list-style-type: none">The possible Khoi kraals and shepherds' huts (JG040; JG064; JG066; JG081-JG090) – 40 m buffer centered on JG088;The possible "wolwehok" (JG036) – 20 m buffer; andThe rock engraving (JG044) - 20 m buffer.							

Impact Phase: Construction							
Potential impact description: Possibility of encountering fossils during groundworks							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	L	Negative	L	L	H
With Mitigation	L	H	L	Neutral/ Positive	L	L	H
Can the impact be reversed?			No, palaeontological heritage resources are non-renewable and key contextual data for fossils (sedimentology, taphonomy) is difficult to reconstruct following disturbance.				
Will impact cause irreplaceable loss or resources?			Possible but Unlikely, well-preserved, scientifically valuable fossils are scarce within the project area and those that do occur probably occur widely across the region.				
Can impact be avoided, managed or mitigated?			Yes, effective mitigation of chance fossil finds by the ECO and a professional palaeontologist is possible.				
Mitigation measures:							
<ul style="list-style-type: none">• Implementation of a Chance Fossil Find Protocol;• Reporting by the ECO of any chance fossil finds to SAHRA and their conservation (preferably <i>in situ</i>);• Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with pertinent contextual data (stratigraphy, sedimentology, taphonomy) within the final footprint; and							

- Curation of any recovered fossil material within an approved repository (museum / university fossil collection) by a qualified palaeontologist.

9.6 Visual

The transmission lines cross a variety of terrains, from large flat mountain plateau on the eastern side (where the authorised DA2S WEF is located) to flat rocky outcrops, this means that it is visible from any direction within its immediate surrounds. However, Route 1 and Route 2 traverses along the same line for about 20 km towards the existing Eskom Hydra substation, and is also adjacent to the existing Eskom Hydra Roodekuil 220 kV transmission line for most of its length. Both routes also follow an existing grid connection transmission route of the operational Longyuan Mulilo De Aar 2 North WEF, for much of their lengths. The proposed project is therefore likely to have a low impact in terms of the visual influence on the receiving environment.

Although the transmission line will be seen from the N10, the visual impacts are considered to be low as the character views from the road has already been impacted by the existing electric transmission infrastructure, such as the existing Eskom Hydra Substation and various other transmission lines. The proposed switching station is unlikely to have a contribution to the visual impacts on the N10 as it is located further away and will be located on top of a plateau above the plains at an altitude of 1,500 metres.

It is assumed that the construction and decommissioning of the grid infrastructure will occur at the same time as that of the DA2S WEF. The visual impacts of the proposed development will be the same during construction and decommission. The following potential visual impacts was considered for the proposed development.

9.6.1 Construction and Decommissioning Phases

Impact Phase: Construction and Decommissioning							
Potential impact description: Construction of Grid Connection and Switching Station <ul style="list-style-type: none">Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction.Dust emissions and dust plumes from increased traffic on gravel roads serving the construction site may evoke negative sentiments from surrounding viewers.Surface disturbance during construction would expose bare soil which could visually contrast with the surrounding environment.Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Negative	M	M	M
With Mitigation	M	L	L	Negative	L	L	M
Can the impact be reversed?			Yes, once construction and / or decommission is complete.				
Will impact cause irreplaceable loss or resources?			Yes, there may be slight change to the receiving environment.				
Can impact be avoided, managed or mitigated?			Yes, by implementing mitigation measures.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">Grid Connection should be constructed / decommissioned at approximately the same time as the authorised DA2S WEF.Management plans must be put in place to ensure most suitable construction period is recommended and to avoid delays in construction. especially with using the N10 for delivery of loads.							

- Any loose material should be removed or covered regularly to maintain a neat site and avoid dust and litter.
- Dust suppression techniques are recommended on all access roads; and on all soil stockpiles.

9.6.2 Operation Phase

Impact Phase: Operation							
Potential impact description: Operation of Grid Connection and Switching Station							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	L	Negative	M	M	M
With Mitigation	L	M	L	Negative	L	L	M
Can the impact be reversed?			Yes, if the infrastructure is decommissioned.				
Will impact cause irreplaceable loss or resources?			Yes, but only to a small extent.				
Can impact be avoided, managed or mitigated?			Yes, by implementing mitigation measures.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Where possible, limit the number of maintenance vehicles using access roads.Minimise light fittings to avoid distraction to the travelers using the N10.							

9.7 Social

The development of the transmission line and associated infrastructure will have short-term positive and negative social impacts which can be mitigated to acceptable levels.

As the sense of place of the area has already been impacted by the existing electric infrastructure, the construction of the development will have a low impact on the sense of place after mitigation. The development will also have benefits to the economic development of the area. The supply of renewable energy to the national grid, within the Central Strategic Infrastructure Corridor, will form part of a provincial and national effort to reduce the carbon emissions in South Africa.

9.7.1 Construction Phase

Impact Phase: Construction							
Potential impact description: Influx of job seekers							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	L	Negative	M	M	M
With Mitigation	M	L	L	Negative	L	L	M
Can the impact be reversed?			Yes, by not proceeding with the development or the implementation of the project.				
Will impact cause irreplaceable loss or resources?			No, not at a community level.				
Can impact be avoided, managed or mitigated?			Yes				
Mitigation measures to reduce residual risk or enhance opportunities:							

- To avoid the influx of job seekers to the area, the local community should be approached to employee low to semi-skilled workers.
- Limit the availability of allowing employment opportunities on-site.
- Although the significance of this impact is low, the influx of job seekers cannot be avoided or prevented.

Impact Phase: Construction

Potential impact description: Potential safety risk for farmers and farming infrastructure.

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Negative	M	M	M
With Mitigation	M	L	L	Negative	L	L	M
Can the impact be reversed?			Yes, by compensating potential losses or damages to farmers.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• The proposed site should be clearly demarcated to effectively monitor and contain the movement of construction workers to the vicinity of the project site as best possible.• Transportation for the construction workers need to be arranged by the applicable contractor on a daily basis, to effectively manage the movement of construction workers to and from the project site. This will reduce the potential risk regarding the trespassing of construction workers on farmers’ properties. Where necessary arrangements need to be made to enable construction workers to return to their hometowns over weekends at least.• No staff should be accommodated over-night on the construction site, except for the presence of security staff throughout the night on site due to security reasons for the landowners and their workers.• A code of conduct which must be signed by construction workers prior to the construction phase, should clearly outline the acceptable behaviour and activities of construction workers.• The applicable contractor should enter into an agreement with the farmers prior to the construction phase, whereby if damages / losses to farming property / infrastructure is proved to be associated with the development activities, famers will be compensated for.• The applicable contractor should hold the appointed contractors liable for the compensation to farmers for any damages or losses that can be associated with the construction phase of the proposed project. This should also be included in the Code of Conduct signed by all key stakeholders. It is however important that dismissals or fines must comply with the South African labour legislation.							

Impact Phase: Construction

Potential impact description: The potential impacts of heavy vehicles and construction related activities, damage to roads, and dust pollution.

	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Negative	M	M	M
With Mitigation	M	L	L	Negative	M	M	M
Can the impact be reversed?	Yes, through the rehabilitation of affected areas.						
Will impact cause irreplaceable loss or resources?	No.						

Can impact be avoided, managed or mitigated?	Yes
<p>Mitigation measures to reduce residual risk or enhance opportunities:</p> <ul style="list-style-type: none"> • Transportation of construction material on the N10 national road to the site should be planned to avoid weekends as well as holiday periods. • Key stakeholders, landowners and municipal representatives of the affected area should be notified in advance of the dates and times for when the roads will be used for the transportation of any abnormal loads. • Measures for dust suppressions should be implemented on a regular basis to minimise potential dust pollution, such as wetting of gravel roads. • All vehicles related to the construction related activities should adhere to the speed limits. • Vehicles that are used for the transportation of loose building materials, for example sand, should be fitted with covers to avoid any spillage. • The appointed contractors should ensure that all vehicles are road-worthy and that the drivers of all vehicles have the relevant licensing documents. • Appropriate waste management strategies need to be implemented on a regular basis by the contractor for any waste generated during the construction phase and should also be included in the Environmental Management Programme (EMPr). • The Environmental Management Programme (EMPr) should include measures to be implemented, to ensure that speed limits are adhered to at all times and that gates are closed at all times. 	

Impact Phase: Construction							
Potential impact description: The increased risk of potential veld fires associated with the construction phase to farmers property and infrastructure.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Negative	M	M	M
With Mitigation	M	L	L	Negative	L	L	M
Can the impact be reversed?			Yes, by compensating potential property / infrastructure farming losses that were caused during the fires, and repairing any damages caused.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• Firebreaks must be implemented by the contractor around the perimeters of the construction site.• No construction staff should be accommodated on the site over-night except for the presence of security personnel.• No smoking should be permitted on the site.• The appointed contractor should ensure that no open fires for the use of cooking or heating should be allowed, except for designated areas and if necessary.• Adequate fire-fighting equipment should be provided by the contractors and should be readily available and serviced on a regular basis.• An on-site fire marshal should be assigned to the development.• The appointed contractors should ensure that any construction related activities that might pose potential fire risks, for example welding and grinding, are confined to the designated areas and that it is properly managed.• The necessary precautionary measures need to be taken during high wind conditions and dry months.• In the event of a fire due to construction related activities, the contractor must repair any damages caused to the farmers. The farmers need to be compensated for any damages caused due to fires borne during construction related activities. The costs with regards to firefighting should also be borne by the contractor.							

Impact Phase: Construction							
Potential impact description: Positive Impacts of Job creation, skills development and business opportunities to local and regional Small, Medium and Micro-sized Enterprises (SMMEs) and other businesses for service delivery.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	L	M	Positive	M	M	M
With Mitigation	H	L	H	Positive	M	M	M
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed or mitigated?			Yes, but it would be undesirable to avoid, as it is a positive impact.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• A local skills database should be established for the associated areas. The existence of such a skills database should be made available to the contractors before the commencement of the construction phase to establish the extent of the available service providers in the local municipalities.• The potential employment opportunities and the employment procedure that the developer intends to follow should be clearly communicated to key stakeholders, local authorities and the community before the commencement of the construction phase.• Efforts should be made to employ local contractors first, where low to semi-skilled workers are required, and gender equality and BBEEE compliant contractors should be considered when recruiting such employees / contractors.							

9.7.2 Decommissioning Phase

Impact Phase: Decommissioning							
Potential impact description: Potential loss of employment opportunities and associated income							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	M	M
With Mitigation	M	L	L	Negative	M	M	M
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">None.							

9.8 Traffic

Traffic impacts are related to the affect the proposed development will have on the N10 and minor roads during construction and decommissioning phases.

9.8.1 Construction and Decommissioning Phase

Impact Phase: Construction and Decommissioning							
Impact Description: Additional Traffic on major and minor roads							
During transportation of the construction material, consideration must be made for the time and period in the year which these roads will be used.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	M	Negative	M	M	M
With Mitigation	L	L	L	Negative	L	L	M
Can the impact be reversed?			No, unless the use of the N10 will be avoided.				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed or mitigated?			Yes, impacts can be managed and mitigated.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Where possible, transportation of construction material should be planned in such a way that delivery occurs at the same time as that of the WEF material; andA Traffic Management Plan (TMP) should be designed before construction by a transport and traffic specialist. This plan should document important details pertaining to transporting of goods and movement of vehicles on site, such as the estimation of abnormal load trips, if required, will be made to site; approved routes for access to site; areas to erect signage along major and minor roads; etc.							

Impact Phase: Construction and Decommissioning							
Impact Description: Minor road degradation Additional heavy traffic on Minor roads could degrade the existing road pavement.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	L	M	Negative	M	M	M
With Mitigation	L	L	L	Negative	L	L	M
Can the impact be reversed?			Yes				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed or mitigated?			Yes, impacts can be managed and mitigated.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• If the development will construct any new minor roads, best practice would be to carry out regular maintenance of the new roads to ensure that its condition is maintained or improved.• If any existing gravel roads will be used, document the condition of the existing roads prior to construction. This will provide support if held liable to repair or upgrade roads claimed to be damaged during construction of the proposed development.• If any existing roads will be used, these roads, if necessary, should be upgraded to accommodate the use by proposed construction vehicles.• If any damage is caused to existing roads used by construction vehicles, these roads should be repaired to the state it was pre-construction.							

10 ASSESSMENT OF CUMULATIVE IMPACTS

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

10.1 Soil

It was concluded that the development will pose a low significant impact on soil and agriculture potential of the site. As the soil and agricultural impact of the proposed development is negligible, far more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change are exceeded. Acceptable levels of change in terms of other types of impact, for example visual impact, would be exceeded long before the levels for agricultural impact became an issue. For the above reasons, the cumulative agricultural impact of the proposed development can confidently be assessed as negligible without entering into a more formal assessment.

10.2 Aquatic

In the cumulative assessment of the proposed development, several projects within a 35km radius have been reviewed and or sites accessed during the course of travelling between the various projects. Of these potential projects, aquatic specialist has been involved in the initial EIA aquatic assessments or has managed / assisted with the WUL process for several of them.

All of the projects have indicated that this is also their intention with regard to mitigation, i.e., selecting the best possible routes to minimise the local and regional impacts and improving the drainage or hydrological conditions, with these rivers the cumulative impact could be seen as a net benefit. However, the worse-case scenario has been assessed below, i.e., only the minimum of mitigation be implemented by the other projects, and that flows within these systems are sporadic. This is also coupled to fact the several existing transmission lines already occur within the region.

Impact Phase: Cumulative							
Potential impact description: Impact on Aquatic Systems							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	M	Negative	M	M	H
With Mitigation	L	L	L	Negative	L	L	L
Can the impact be reversed?			Yes, due to the nature of the projects and surrounding aquatic ecosystems				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed or mitigated?			Yes				
Mitigation measures to reduce residual risk or enhance opportunities by local land owners and or Provincial / District Roads organizations within the study area:							

- Improve the current stormwater and energy dissipation features not currently found along the tracks and roads within the region; and
- Install properly sized culverts with erosion protection measures at the present road / track crossings.

10.3 Terrestrial Ecology

Cumulative impacts include an assessment of the impacts of the proposed project taken in combination with the impacts of other known projects for the area or secondary impacts that may arise from changes in the social, economic or ecological environment.

Impacts on broad-scale ecological processes and cumulative habitat loss, connectivity or potential for the area to meet long-term conservation objectives (such as CBAs, ESAs, IBAs and NPAES areas).

Impact Phase: Cumulative							
Potential impact description: Impacts on Broad-Scale Ecological Processes Disruption of dispersal and gene flow of flora and fauna across the landscape, disruption of moisture, soil/sedimentation and fire regimes.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	L	Negative	L	L	H
With Mitigation	L	H	L	Negative	L	L	H
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities: <ul style="list-style-type: none">The various mitigation and management plans associated with the development should be followed and implemented effectively to reduce the cumulative contribution of the current development.							

Impact Phase: Cumulative							
Potential impact description: Impact on Conservation Objectives Cumulative impact on CBAs and Conservation Objectives							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	L	Negative	L	L	H
With Mitigation	L	H	L	Negative	L	L	H
Can the impact be reversed?			No.				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">• The final position of new servitudes and pylons should be identified in the field through a reconstruction walk-through to microsite these features and avoid impact on sensitive species and habitats.• The various mitigation and management plans associated with the development should be followed and implemented effectively to reduce the cumulative contribution of the current development.							

10.4 Avifauna

A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other nearby activities as a result of the proposed development. Two operational wind energy facilities occur in the vicinity, Longyuan Mulilo De Aar 1 Wind Energy Facility (100MW), located approximately 20 km west of the project site, and Longyuan Mulilo De Aar 2 North Wind Energy Facility (140MW) located approximately 3 km to the north. When assessed together with other proposed wind energy facilities nearby (e.g., Zingesele WEF) the risks of collisions of birds with infrastructure and electrocution increases the potential to have a cumulatively negative impact on the avifauna of the area. The addition of the proposed line, however, is unlikely to significantly increase the cumulative impact on birds if mitigation measures are adhered to. This is largely due to the proximity of the study site to the existing Eskom Hydra Substation, and the large number of associated transmission lines that already exist in the area.

Impact Phase: Cumulative							
Potential impact description: Impact on habitat destruction, collisions and electrocution, in the context of existing power lines in the area.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	M	H	Negative	M	M	M
With Mitigation	M	M	H	Negative	M	M	M
Can the impact be reversed?			Unlikely. Reversal would require the decommissioning of all the transmission infrastructure in the area.				
Will impact cause irreplaceable loss of resources?			Potentially. The wider area is important for the conservation of some Red Data species and some habitat loss and mortality may occur.				
Can impact be avoided, managed or mitigated?			Partially. Much of the cumulative impact risk already exists along the route and it is unlikely that the proposed development will significantly increase the negative impact on birds. The intensity of the cumulative impact can be reduced if mitigation measures are adhered to.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">The various mitigation and management plans associated with the development should be followed and implemented effectively to reduce the cumulative contribution of the current development and enhance opportunities.							

The impact table identifies the significance of the cumulative risk as medium, however as the majority of the proposed power line follows existing power lines for most of the route, **it is the specialists opinion that the cumulative impact of an additional line is considered to be of low significance** as much of the impact associated with the proposed power line are already present. Indeed, some opportunity exists with the development of a new power line to reduce some of the residual risks associated with the current infrastructure on the site. This may seem counter-intuitive, however the existing line traverses habitat features that increase the risk of collisions, such as aquatic environments, but it is not fitted with flappers or bird flight diverters to reduce potential collisions. The proposed power line running adjacent to the existing power line, if fitted with such mitigation measures and with a staggered pylon design (relative to the existing pylons), may increase the visibility of the existing power line to birds and reduce overall collisions along the route. Where the proposed power line runs alongside smaller, lower voltage transmission lines, the higher and larger lattice towers typical of higher voltage power lines (as proposed) are more likely to be used as perches than the smaller towers.

As the larger towers used for higher voltage transmission have larger the clearances between the electrical infrastructure components, preferential use of these towers as perches may reduce the overall likelihood of electrocution.

10.5 Heritage, Archaeology and Palaeontology

In respect of potential cumulative impacts on palaeontological resources of the proposed project, the mixed nature of the geology of the area and the low level of surface and near surface exposure of fossil-bearing rocks where they do occur in the area suggests that the cumulative impact will be low.

Archaeological material and historical sites are potentially far more at risk from the cumulative impacts, given its widespread occurrence and exposure across the area. Multiple human activities in the landscape, of which the installation of the grid connection is the latest, can erode the integrity of these resources through their physical damage or destruction. While at an individual project level these impacts may not appear to be significant, the cumulative effects of multiple developments or activities on archaeological and historical heritage resources can be high. The implementation of measures to mitigate project level impacts can do much to reduce cumulative impacts.

10.6 Visual

In terms of the cultural landscape, the presence of existing infrastructure in the area - the railway system, the N10 and the electrical and linear infrastructure related to the existing Eskom Hydra substation and the various wind and solar energy facilities surrounding De Aar – suggests that the additional transmission lines are unlikely to be out of place in the local environment, although they will add to the cumulative effect of modern development on the cultural landscape.

As there are existing electric infrastructure within the development are, the significance of this cumulative impact will be low.

Impact Phase: Cumulative							
Potential impact description: Cumulative Visual Impact							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	M	L	Negative	M	M	M
With Mitigation	L	M	L	Negative	L	L	M
Can the impact be reversed?			Yes, if the infrastructure is decommissioned.				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">None.							

10.7 Social

The establishment of a number of renewable energy facilities and associated infrastructure in the region will create employment, skills development and training opportunities, and creation of downstream business opportunities for the local community.

Impact Phase: Cumulative							
Potential impact description: Impact on the local economy							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	M	H	M	Positive	M	M	M
With Mitigation	M	H	M	Positive	M	M	M
Can the impact be reversed?			n/a				
Will impact cause irreplaceable loss or resources?			No.				
Can impact be avoided, managed or mitigated?			Yes.				
Mitigation measures to reduce residual risk or enhance opportunities:							
<ul style="list-style-type: none">Key stakeholders, the developers and local municipalities should work together to ensure development of renewable energy projects will provide a positive impact to the social and economic status of the local community.							

10.8 Traffic

Cumulative Impacts for the transport and traffic associated with the proposed development can be considered negligible. The construction and decommission of the proposed development will have limited impact on the R399 and N10, which may be used, even during peak periods such as school vacations, and peak seasonal holiday periods. No mitigation measures are required.

11 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Figure 11.1 and 11.1a - d reflects the Environmental Sensitivity of the proposed development.

11.1 Geology, Soil and Agriculture

The proposed project will have negligible impact in this study area for two reasons:

- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines; and
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is restricted to pylon bases and a small substation that, in the context of the agricultural environment of low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

The proposed development is on land zoned and used for agriculture (grazing). South Africa has very limited arable land and it is therefore critical to ensure that development does not lead to an inappropriate loss of land that may be valuable for cultivation. No agriculturally sensitive areas occur within the proposed site and no part of it is therefore required to be set aside from the development.

This assessment has found that the proposed development will have no impact on any arable land. Because of the low agricultural potential of the site, the low agricultural impact potential of the kind of development that is proposed, and the consequent **low** agricultural impact, **there are no restrictions relating to agriculture (including soils) which would preclude authorisation of the proposed development.** The proposed development will not have an unacceptable, negative impact on the agricultural production

capability of the site. Therefore, from an agricultural impact point of view, the development should be authorised.

11.2 Freshwater and Wetlands

The proposed development is likely to have limited impact on the aquatic environment as for the most part the final placement of the towers could avoid the delineated wetlands and potentially span watercourses. It has however been assumed that due to the width of some of the broader alluvial systems, some towers will need to be placed within these systems, but this would have little impact on these systems, especially if no new permanent access tracks are created within these areas.

Thus, based on the findings of the specialist study, significance of the impacts assessed for the aquatic systems after mitigation would be **low**. The specialist has **no objection to the authorisation of any of the proposed activities for the proposed development**.

11.2.1 Aquatic Permit Requirements

The final number of actual water course crossings should be determined when micro-siting occurs, as these would trigger the need for a WULA / GA in terms of Section 21 c and i of the National Water Act (Act 36 of 1998) (NWA). Should any of the present road crossings need to be upgraded then the opportunity exists to improve the current state (lack of habitat continuity) for example by replacing pipe culverts with box culverts. This opportunity to improve the hydrological conditions can be seen as a net benefit and was been assessed as part of the cumulative impact statement. DHSWS will determine if a GA or WULA application will be required during the pre-application phase, and typically if one of the below identified water-uses requires a WULA then all applications will be treated as a WULA and not GA.

Based on an assessment of the proposed activities and past engagement with DHSWS, the following WULs / GA's could be required based on the following thresholds as listed in the following Government Notices:

- DHSWS Notice 538 of 2016, 2 September in GG 40243– Section 21 a & b, Abstraction and Storage of water.
- Government Notice 509 in GG 40229 of 26 August 2016 – Section 21 c & i, Impeding or diverting the flow of water in a watercourse and or altering the bed, banks, course or characteristics of a watercourse.

The application process has been initiated with the Department of Water and Sanitation and an update will be included in the Final BAR.

	Water Use Activity	Applicable to this development proposal
S21(a)	Taking water from a water resource	Only water if water is abstracted from a local river or borehole
S21(b)	Storing water	If the total volume stored is greater than 40 000 m ³ then a full Water Use License will be required. This is however unlikely due to the scale of the project and the need for such large volumes.
S21(c)	Impeding or diverting the flow of water in a watercourse	Yes – several new crossings of watercourses (i.e., activities within 500m of a wetland or towers may be placed within the alluvial areas if they cannot span these wide systems) will be required. A GA process can potentially be followed as the draft Risk Assessment Matrix

	Water Use Activity	Applicable to this development proposal
		indicates all impacts are LOW, but this will be finalised once the response on the WUL application is received.
S21(d)	Engaging in a stream flow reduction activity	Not applicable
S21(e)	Engaging in a controlled activity	Not applicable
S21(f)	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit	Not applicable
S21(g)	Disposing of waste in a manner which may detrimentally impact on a water resource	Only portable toilets will be required, and assuming that there will not be conservancy tanks of more than 10 000m ³ per farm portion.
S21(h)	Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process	Not applicable
S21(i)	Altering the bed, banks, course or characteristics of a watercourse	Yes – several new crossings of watercourses (i.e., activities within 500m of a wetland or towers may be placed within the alluvial areas if they cannot span these wide systems) will be required. A GA process can potentially be followed as the draft Risk Assessment Matrix indicates all impacts are LOW, but this will be finalised once the response on the WUL application is received.
S21(j)	Removing, discharging or disposing of water found underground for the continuation of an activity or for the safety of persons	Not applicable
S21(k)	Using water for recreational purposes	Not applicable

11.3 Flora and Terrestrial Fauna

The low overall footprint of the development within the ESAs, CBAs and NPAES Focus Areas, combined with the fact that the proposed routes runs adjacent to existing power lines for most of the routes, means that the development would not compromise the ecological functioning or the long-term conservation value of the area. It was found that the both vegetation types found within the study area are largely intact with very little prospect of long-term transformation through agricultural practices, the species and habitats found within these areas are therefore fairly widespread and not unique to the project site. Although the impact assessment table presents medium significance after mitigation, it is the opinion of the specialist that the impact of the proposed project is considered to be **low** and acceptable following mitigation.

The power lines and associated infrastructure is unlikely to generate significant impacts on flora and fauna after mitigation. No highly significant negative impacts that cannot be adequately mitigated against were observed, therefore **from a terrestrial flora and fauna perspective there are no reasons to oppose the development**. The development can be supported in terms of its low potential impact to terrestrial ecology.

11.4 Avifauna

Significant opportunity exists to increase the visibility of the existing power line that runs adjacent to the proposed power line as the existing power line is unmarked in terms of bird flight diverters or flappers. By attaching bird flight diverters or flappers to the proposed line and potentially staggering the pylon placement in relation to the existing power line the visibility of the lines may increase for those sections where they run parallel to each other. This has the potential to reduce the risk of collision by birds traversing the area as they are already at risk from existing infrastructure.

A number of Red Data species and species vulnerable to collisions with power lines exist in the area of the proposed power line routes. The impact of collisions to birds has a **medium** significance even with the implementation of mitigation measures. However, as the majority of the proposed power line routes is adjacent to an existing power line, which is unmarked in terms of bird flight diverters, the impact significance of collision associated with the proposed power line is unlikely to increase beyond that which already exists. Appropriate bird flight diverters, or flappers should be attached to the full length of the proposed power lines, and pylons/towers should be staggered as much as possible in relation to the adjacent, existing power lines. The motivation for this requirement is due to the route being within an Important Bird Area, crossing near cliffs, over drainage lines and farm dams and being in an area important for collision prone species such as Ludwig's Bustard, Blue Crane and Secretarybird. The other potential impacts assessed are of **low** significance following the implementation of mitigation measures.

Construction activities should be timed to coincide with the local conditions and breeding activity of Verreaux's Eagles to reduce the overall impact. For example, construction activity in seasonally inundated areas should not occur during the peak rainfall period in summer to reduce the impact on wetland habitats, and construction activity near the Verreaux's Eagle nest should not occur during breeding periods in winter.

The proposed project is unlikely to generate significant impacts on avifauna after mitigation. No highly significant negative impacts were observed, therefore **from an avifaunal perspective the proposed project can be authorised if all recommendations and mitigation measures are implemented accordingly.**

11.5 Cultural Heritage, Archaeology and Palaeontology

The fieldwork undertaken to inform this assessment identified Middle Stone Age (MSA), Late Stone Age (LSA) lithic material and Khoi and colonial era stone structures of a generally relatively **low**, local archaeological significance, widely distributed across the landscape. The impacts to archaeological material in the area of the construction of the grid connection and associated infrastructure will be relatively small and localised, although where individual sites or structures are affected the impact will be medium, although this could be reduced to low through the application of measures to mitigate potential loss or damage.

Based on the information that has been collected, indications are that impacts on heritage resources arising from the proposed project will be as follows:

- Palaeontological resources: Given the nature of the proposed project, activities may impact upon fossils if they are present close to the ground surface in the development footprint.
- If existing service roads and access points are used during the construction of the grid connection powerlines this will reduce the potential for impacts on fossil resources and the very small footprint of pylon foundations means that the impact on the fossil heritage resources from the installation of the grid connections is assessed to be very low. Taking all of the above into account, the significance of potential impacts to fossil heritage resources is extremely low.

- MSA: The volume of and apparently ubiquitous nature of the MSA artefacts scattered across the landscape, and the fact that much of this material is in secondary, or disturbed context, means that the combined overall impact significance of activities associated with this project on MSA material will be relatively low;
- LSA: The context of much of the LSA material noted during the survey appears to be better preserved than the MSA material, and is thus of greater archaeological significance. More occurrences that could be called sites were noted with the LSA material, and the possible association of Ostrich Eggshell with some of the early Holocene material eroding out the banks of the Brak River, for example, makes some of these sites of particular interest and importance. Were these sites to be lost or damaged as a result of the construction of the grid connection, the impact significance would be high. The application of measures to mitigate potential loss or damage, however, would reduce the impact significance to low;
- Kraals and Stone Structures: The possible Khoi kraals and other stone structures noted during the survey, represent a little known aspect of the history and archaeology of this area. Their damage or destruction would result in a loss of heritage, and the impact significance would be high. The application of measures to mitigate potential loss or damage, however, would reduce the impact significance to low;
- Graves, cairns and stone features: No graves or cairns were encountered during the survey. Damage to or the destruction of the possible ruined "wolwehok" would have a moderate impact significance. The application of measures to mitigate potential loss or damage, however, would reduce the impact significance to low;
- No impacts are expected to engravings and rock art, historical archaeological sites and materials or the built environment.

Provided that the mitigation measures are implemented, the **overall impact of the proposed installation of the De Aar 2 South WEF grid connection is generally of low heritage significance and the proposed activity is considered acceptable.**

12 CONDITIONS TO BE INCLUDED IN THE ENVIRONMENTAL AUTHORISATION

Any specific conditions to be included in the Environmental Authorisation as advised by the specialist assessments are provided below:

Aquatic

As the proposed activities have the potential to create erosion the following recommendations are made:

- A pre-construction walkthrough with an aquatic specialist is recommended and they can assist with the development of the stormwater management plan and Aquatic Rehabilitation and Monitoring plan, coupled to micro-siting of the final tower layout as required.
- It is further recommended from the project onset that all watercourse areas (inclusive of buffers) are included into any existing EMP as reference, this to ensure a net benefit to the aquatic environment. This should form part of the suggested walk down as part of the final EMP preparation.

Avifauna

- The Verreaux's Eagle nest observed on the cliffs (-30.595564, 24.265331) must be considered a no-go area which should be applied throughout the year during the construction and operational phase.
- Construction activities in the vicinity of the active Verreaux's Eagle nest should be timed to not occur within the breeding periods of these birds (May, June, July and August), a 500 m buffer around the nests represents a minimum area within which construction activities should not occur during these months.

- Construction of pylons or additional access roads in within 200 m of National Freshwater Ecosystem Priority Areas should be avoided to reduce the potential impact on wetland habitats which are important to birds and other species in arid areas.
- Appropriate bird flight diverters, or flappers should be attached to the full length of the proposed power lines, and pylons/towers should be staggered as much as possible in relation to the adjacent, existing power lines.
- An operational monitoring programme must be implemented and include regular monitoring (i.e., quarterly) of the entire length of the power lines for collision and electrocution incidents for the lifespan of the project.
- Collision incidents and mortalities must be recorded and reported to the Endangered Wildlife Trust (EWT).

Heritage, Archaeology and Palaeontology

- Other sites on or close to the grid connection routes require mitigation by avoidance. These sites, each with the buffer described below, must be considered no-go areas during construction activities and those nearest the route alignments must be clearly marked as out of bounds:
 - The possible Khoi kraals and shepherds' huts (JG040; JG064; JG066; JG081-JG090) - 40 m buffer centered on JG088;
 - The possible "wolwehok" (JG036) - 20 m buffer; and
 - The rock engraving (JG044) - 20 m buffer.
- The archaeologist must review the positions of the individual pylons once these have been determined, to ensure that they will not impact on any recorded heritage resources. The micro-siting of pylon positions may be required, which should also be done in consultation with the archaeologist.
- A Fossil Chance Find Protocol must be implemented at the commencement, and for the life of the proposed project.
- Should any human remains be encountered at any stage during the construction or earthworks associated with the project, or any other archaeological or palaeontological material be encountered, work in the vicinity must cease, the remains must be left *in situ* but made secure and the project archaeologist and SAHRA must be notified immediately so that migratory action can be determined and be implemented.
- Should the buffers recommended by the specialist not be possible to avoid the identified heritage resources, a permit in terms of section 35 of the NHRA must be applied for from SAHRA prior to the construction phase. No mitigation work may commence without a permit issued in this regard.
- Permits in terms of section 35 of the NHRA must be applied for the recommended mitigation work for sites JG050-JG052/GEB013-GEB014, JG067-JG072/GEB025 and JG077 prior to construction.
- The recommended walk-down of the micro-siting of pylons must be submitted to SAHRA for review and comment. No construction may commence without comment from SAHRA in this regard.
- A Heritage Management Plan (HMP) must be developed in order to manage the in-situ heritage resources for the construction, operation and decommissioning phases of the development.
- 38(4)c(i) – If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.

- 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule.
- 38(4)d – See section 51(1) of the NHRA.
- 38(4)e – The following conditions apply with regards to the appointment of specialists:
 - i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.

13 IMPACT STATEMENT AND CONCLUSION

Based on the assessments conducted, the construction of the transmission line within the assessed corridor, and switching station, is acceptable from an environmental perspective.

No environmental fatal flaws have been identified, and should all the recommended mitigation measures be implemented, it is anticipated that, overall, impacts would remain of medium to low negative significance. Positive impacts were also identified, that would be realised if the project proceeded. The confidence in the assessment is regarded as acceptable.

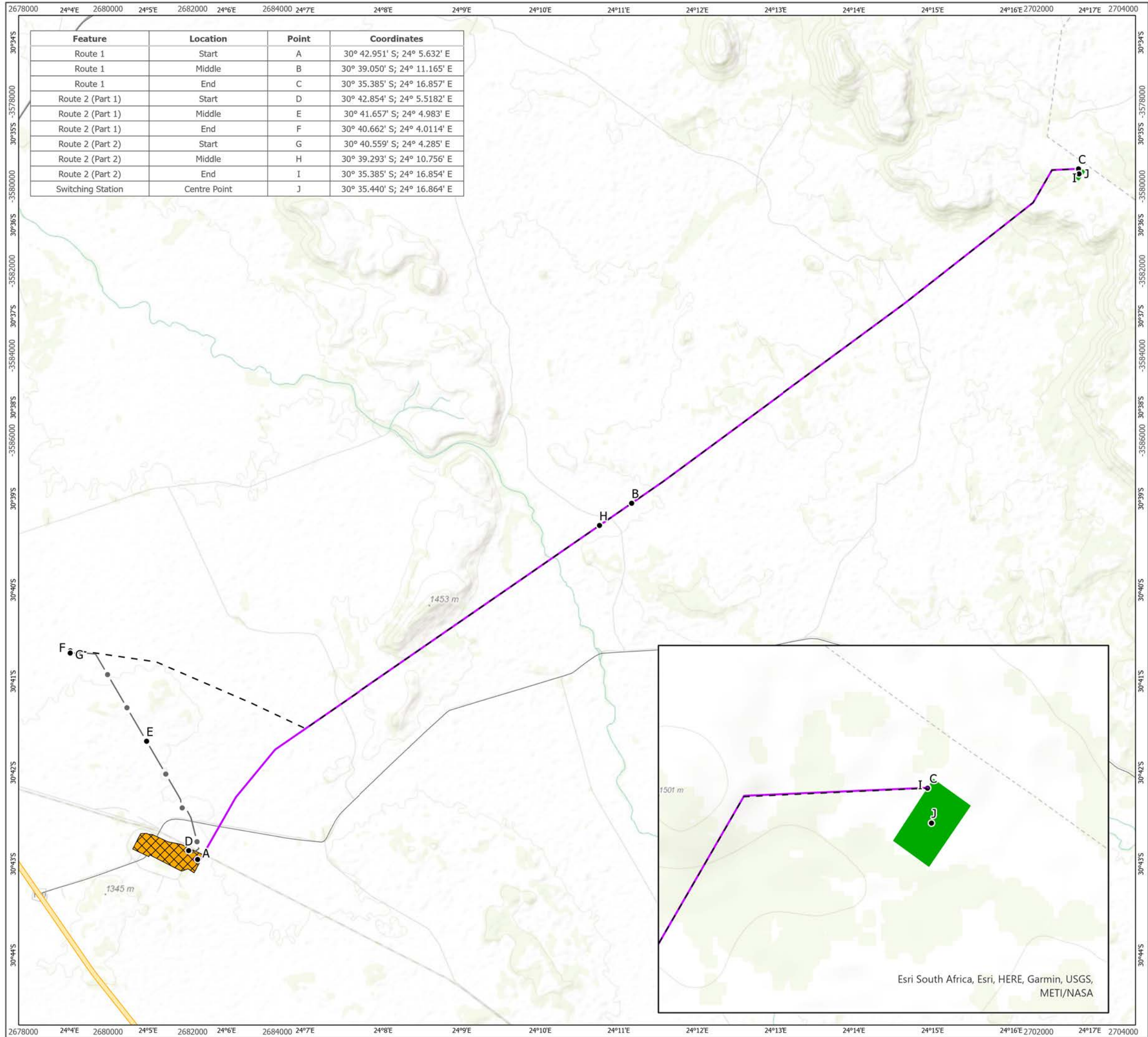
The approval of the proposed development is required for the construction and operation of the authorised De Aar 2 South WEF (DEFF Ref. No.: 12/12/20/2463/1/AM7) to commence. The reason for this later application and separation of the project components in terms of the application process rests with the fact that the Environmental Authorisation for the proposed transmission line and switching station may become the property of Eskom, and would not be controlled by the Applicant.

Taking into consideration the findings of the BA process for the proposed development, it is the opinion of the Environmental Assessment Practitioner (EAP) that the majority of negative impacts associated with the implementation of the proposed project can be mitigated to acceptable levels. While the residual impacts of the project will have a positive socio-economic impact on the local environment, the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people and stakeholders, in terms of renewable energy supply.

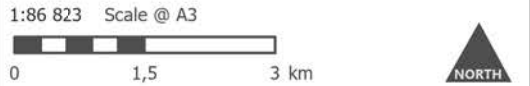
Overall, it is recommended that the De Aar 2 South Transmission Line Route 1 (Alternative 1– The Preferred Alternative) and the switching station be authorised, subject to implementation of the recommended mitigation measures and management actions contained in this BA report and all the specialist reports.

FIGURES

Figure i	: Proposed Development Geographical Co-ordinates
Figure 1.1	: Site Location
Figure 3.1	: Renewable Energy Projects within 35 km radius
Figure 5.1	: Land Use and Land Cover
Figure 5.2	: Critical Biodiversity Areas
Figure 8.1	: Proposed Development Plan
Figure 11.1	: Environmental Sensitivity Map
Figure 11.1a	: Environmental Sensitivity Map (zoomed in)
Figure 11.1b	: Environmental Sensitivity Map (zoomed in)
Figure 11.1c	: Environmental Sensitivity Map (zoomed in)
Figure 11.1d	: Environmental Sensitivity Map (zoomed in)



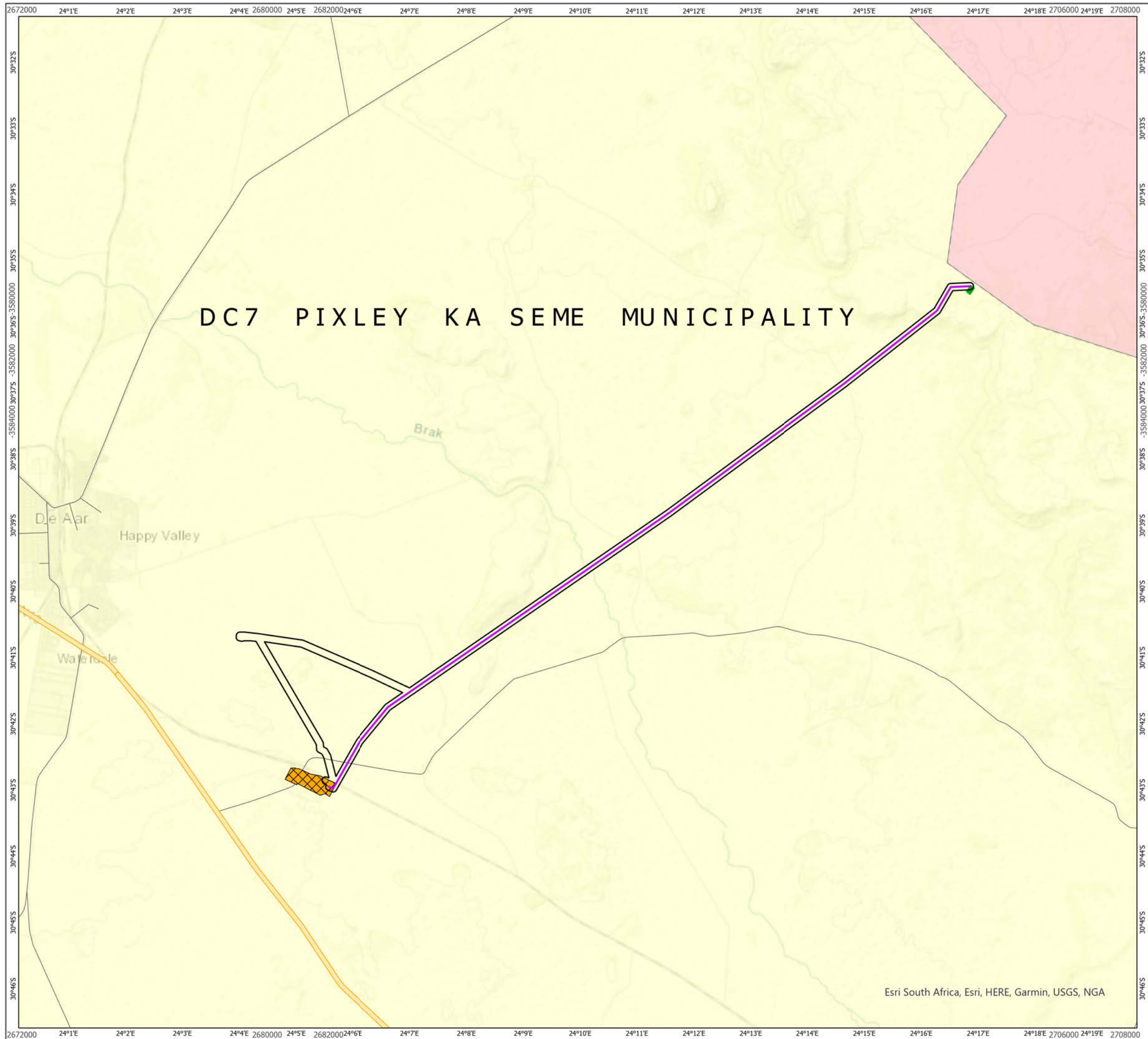
- Existing Eskom Hydra Substation
- N10
- Other Roads
- Proposed Switching Station
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)



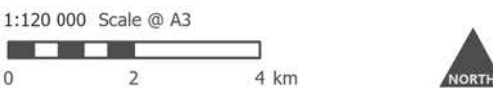
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**Proposed Development
Geographical Co-ordinates**
Figure i

**Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station**



- Existing Eskom Hydra Substation
- N10
- Other Roads
- 200 m Corridor Assessed
- Proposed Switching Station
- Proposed Transmission Line (Preferred Alternative)
 - Transmission Line Route 1
- Local Municipality
 - Emthanjeni Local Municipality
 - Renosterberg Local Municipality



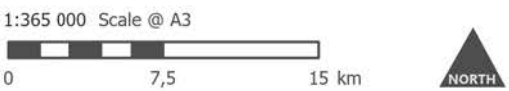
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Site Location
Figure 1.1

Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station



- Existing Eskom Hydra Substation
- REEA within 35km
- REEA and Transmission Lines within 35 km
- Existing Lines within 35km
- Proposed Switching Station
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)

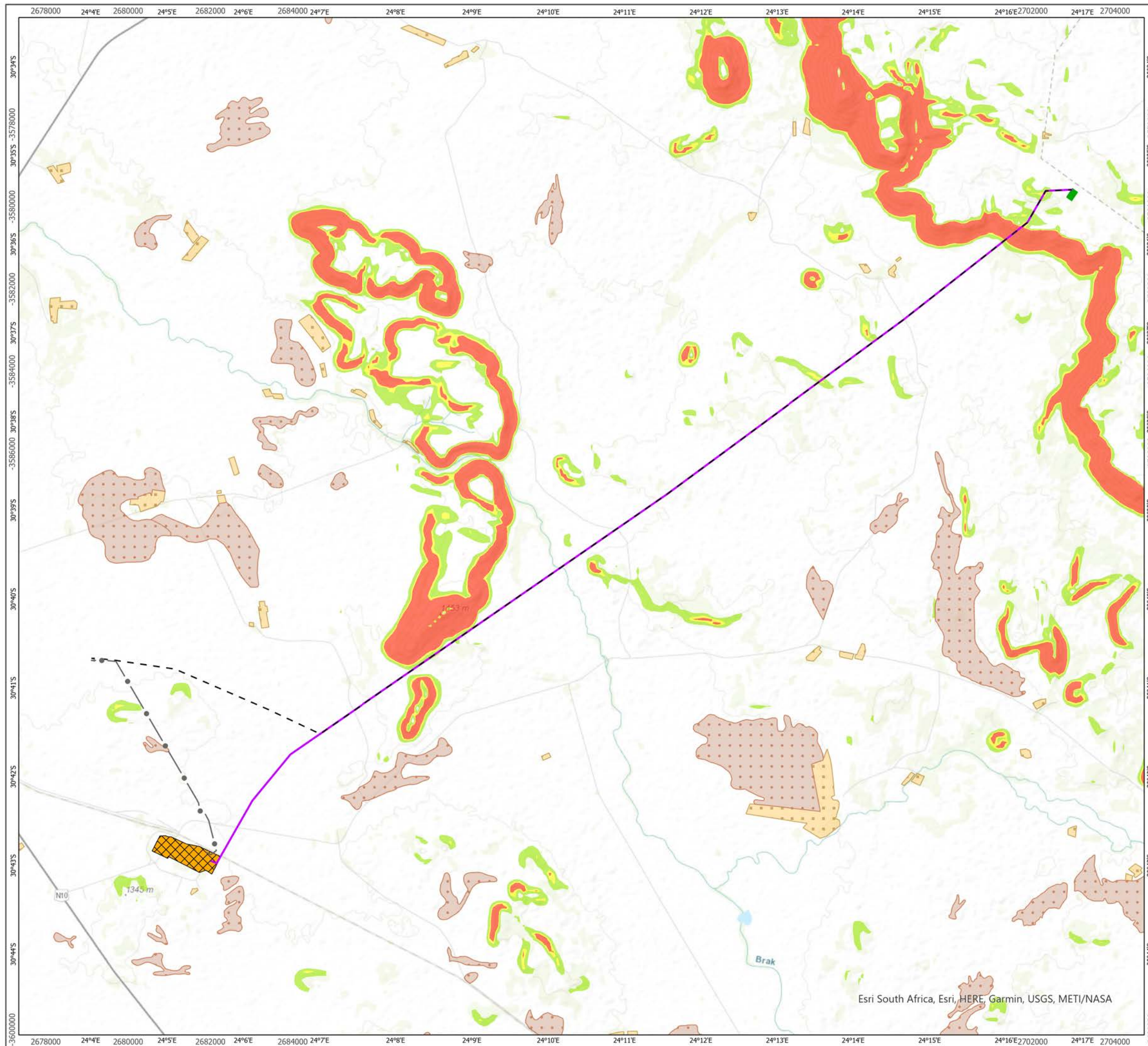


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RE Projects and Transmission Lines within 35 km
Figure 3.1

**Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station**

Esri South Africa, Esri, HERE, Garmin, USGS, NGA



- Existing Eskom Hydra Substation
- Proposed Switching Station
- Route 1 (Preferred Alternative)
- Route 2 (Part 1) (Alternative 1)
- Route 2 (Part 2) (Alternative 1)

Land Use and Land Cover

Land Cover

- Barren Lands
- Cultivated Land

Slope (%)

- 8 - 12
- 12 - 14
- >14

1:90 000 Scale @ A3

0 1,5 3 km



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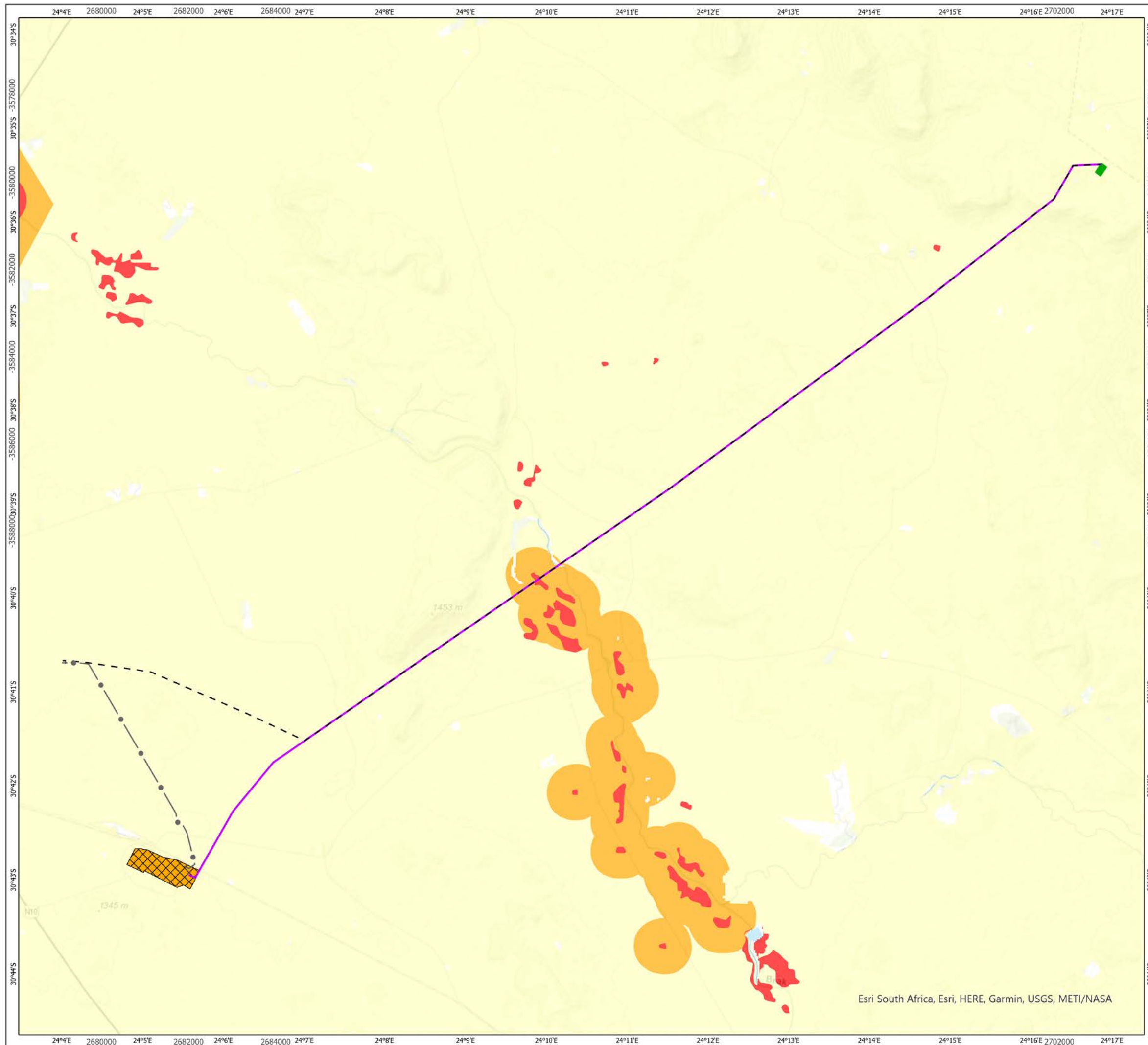
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Land Use and Land Cover Figure 5.1

Basic Assessment Report De Aar 2 South Transmission Line and Switching Station



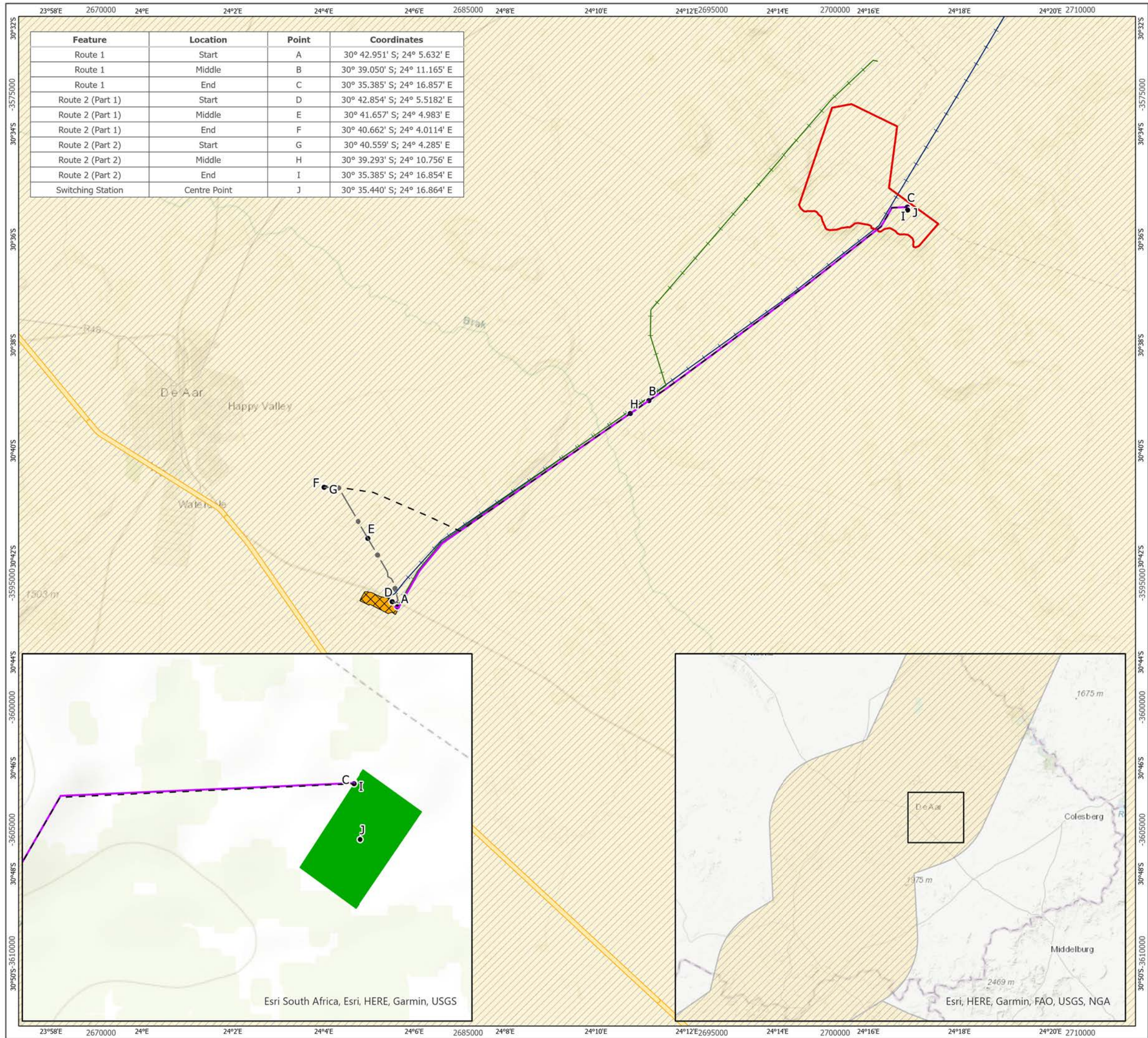
- Existing Eskom Hydra Substation
- Proposed Switching Station
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)
- Critical Biodiversity Areas
 - Critical Biodiversity Area One
 - Critical Biodiversity Area Two
 - Ecological Support Area
 - Protected Area
 - Other



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Critical Biodiversity Areas Figure 5.2

Basic Assessment Report De Aar 2 South Transmission Line and Switching Station



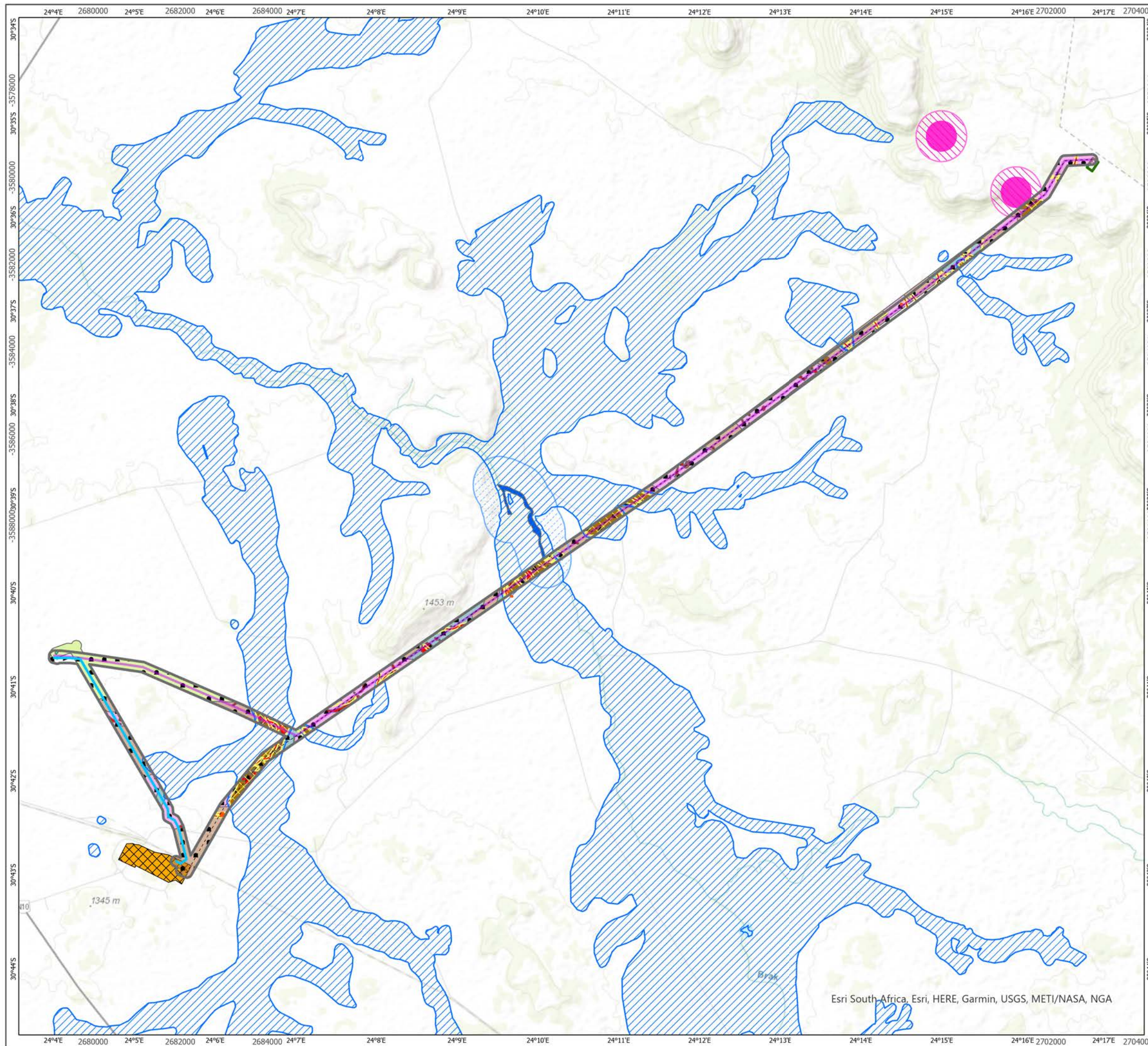
- Proposed Switching Station
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)
- Central Strategic Transmission Corridor
- De Aar South WEF
- Existing Hydra Roodekuil 220kV Transmission Line
- Existing Longyuan Mulilo De Aar 2 North WEF Transmission Line
- Existing Eskom Hydra Substation
- N10



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Proposed Development Plan
Figure 8.1

Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station



- 200 m Corridor Assessed
- Route 2 (Part 2) (Alternative 1)
- Route 2 (Part 1) (Alternative 1)
- Route 1 (Preferred Alternative)
- Archaeological No-Go
- Archaeological Mitigation Area
- Medium Sensitivity Birds
- Low Sensitivity Birds
- Ecology High Sensitivity
- Ecology Medium Sensitivity
- Ecology Low Sensitivity
- Alluvial watercourses 48m buffer
- Wetland
- Dam
- Regulated 500m WUA zone
- High Sensitivity Birds
- Verreuxs Eagle Nest 500 m buffer
- Palaeontological Sensitivity
 - High
 - Low
 - Moderate
 - Very High
- Proposed Switching Station
- Existing Eskom Hyrda Substation

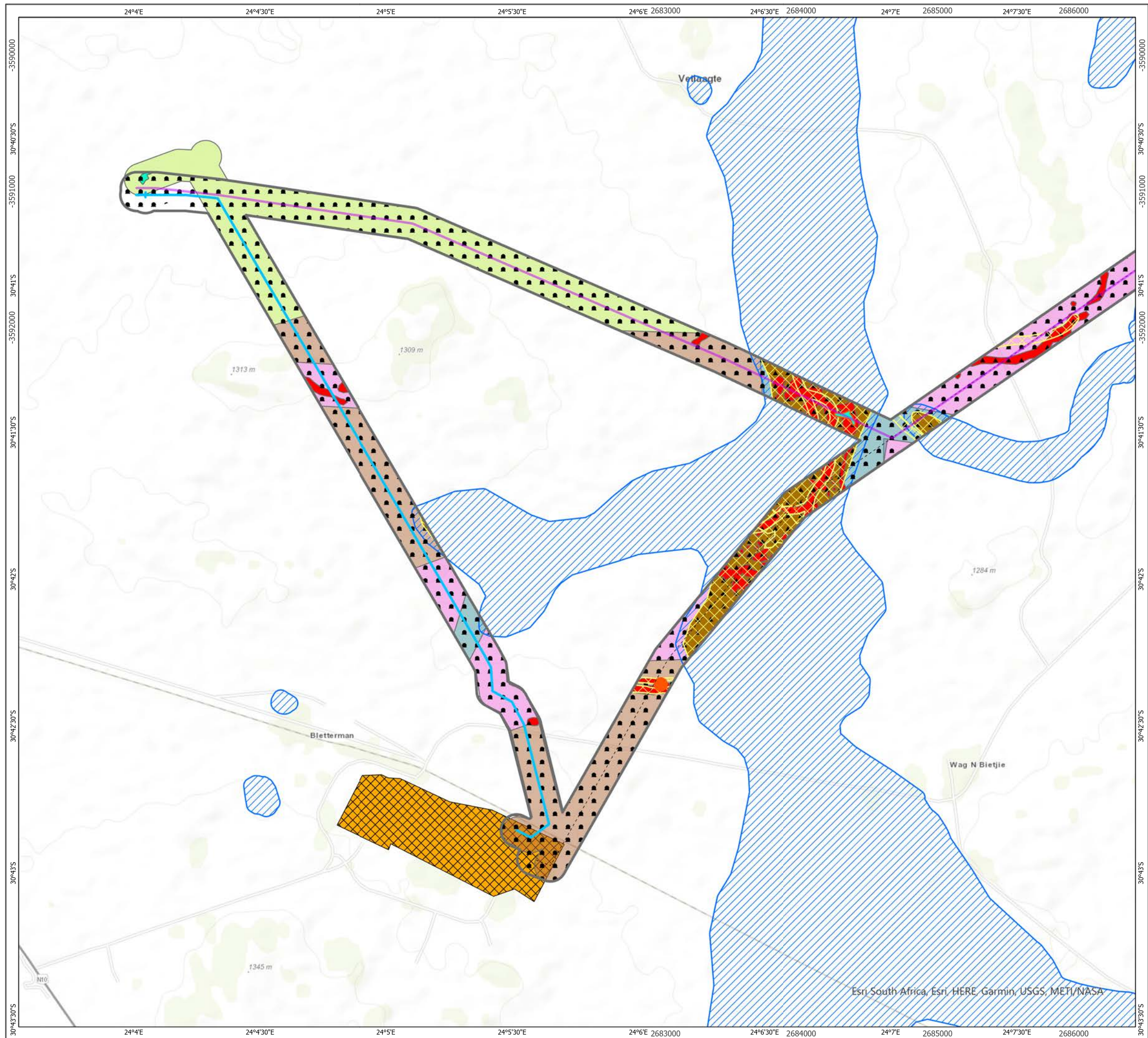
1:85 000 Scale @ A3
0 1,5 3 km
NORTH

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Environmental Sensitivity Map

Figure 11

Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station



Existing Eskom Hydra Substation

Proposed Transmission Lines

Route 1 (Preferred Alternative)

Route 2 (Part 1) (Alternative 1)

Route 2 (Part 2) (Alternative 1)

Proposed Switching Station

200 m Corridor Assessed

Archaeological No-Go

Archaeological Mitigation Area

Medium Sensitivity Birds

Low Sensitivity Birds

Ecology High Sensitivity

Ecology Medium Sensitivity

Ecology Low Sensitivity

Alluvial watercourses 48m buffer

Wetland

Dam

Regulated 500m WUA zone

Verreuxs Eagle Nest 500 m buffer

Palaeontological Sensitivity

High

Low

Moderate

Very High

1:27 000 Scale @ A3



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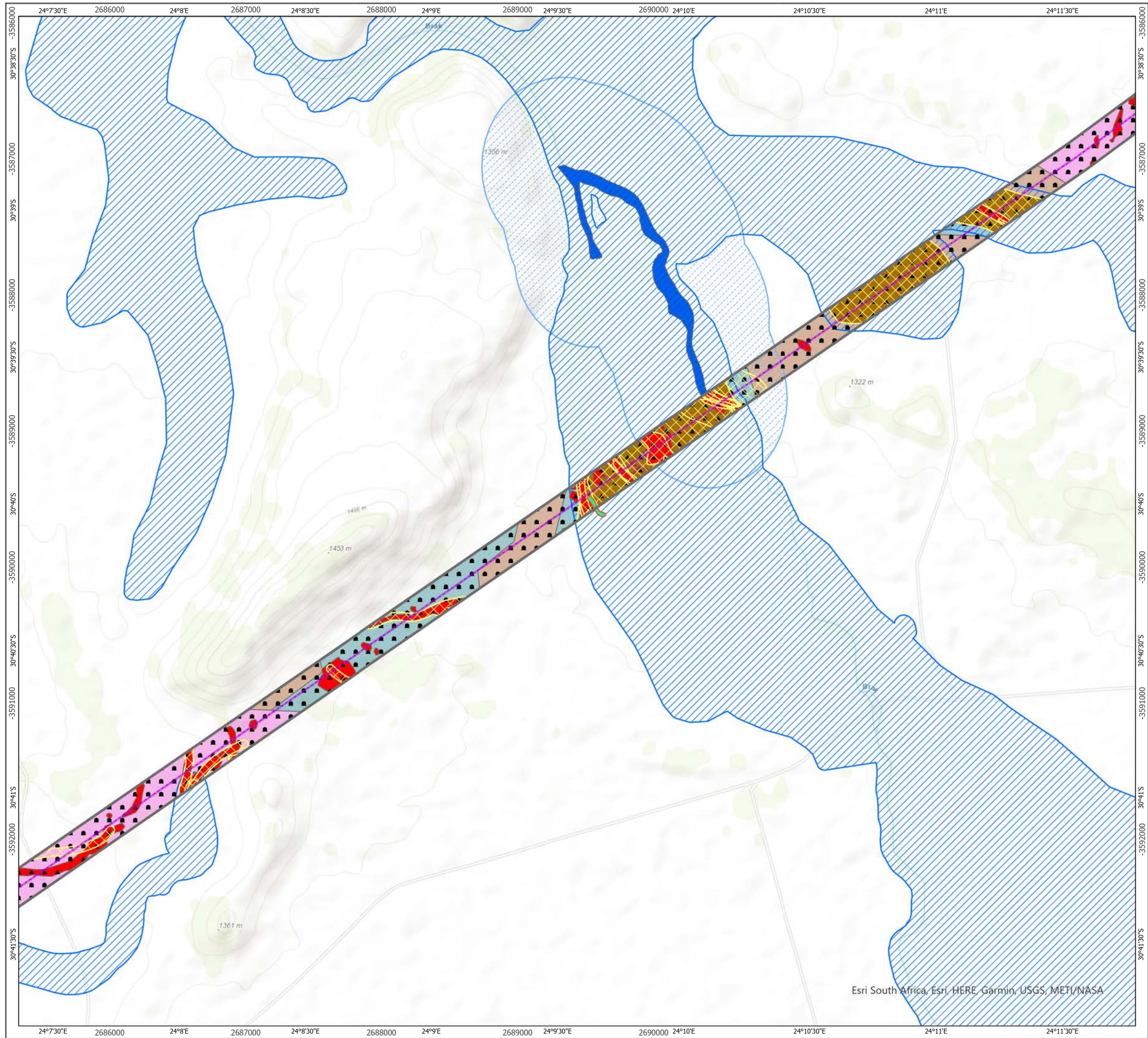
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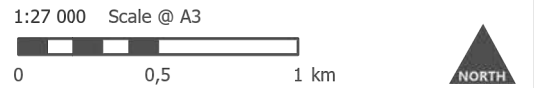
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Environmental Sensitivity Map Figure 11a

Basic Assessment Report De Aar 2 South Transmission Line and Switching Station



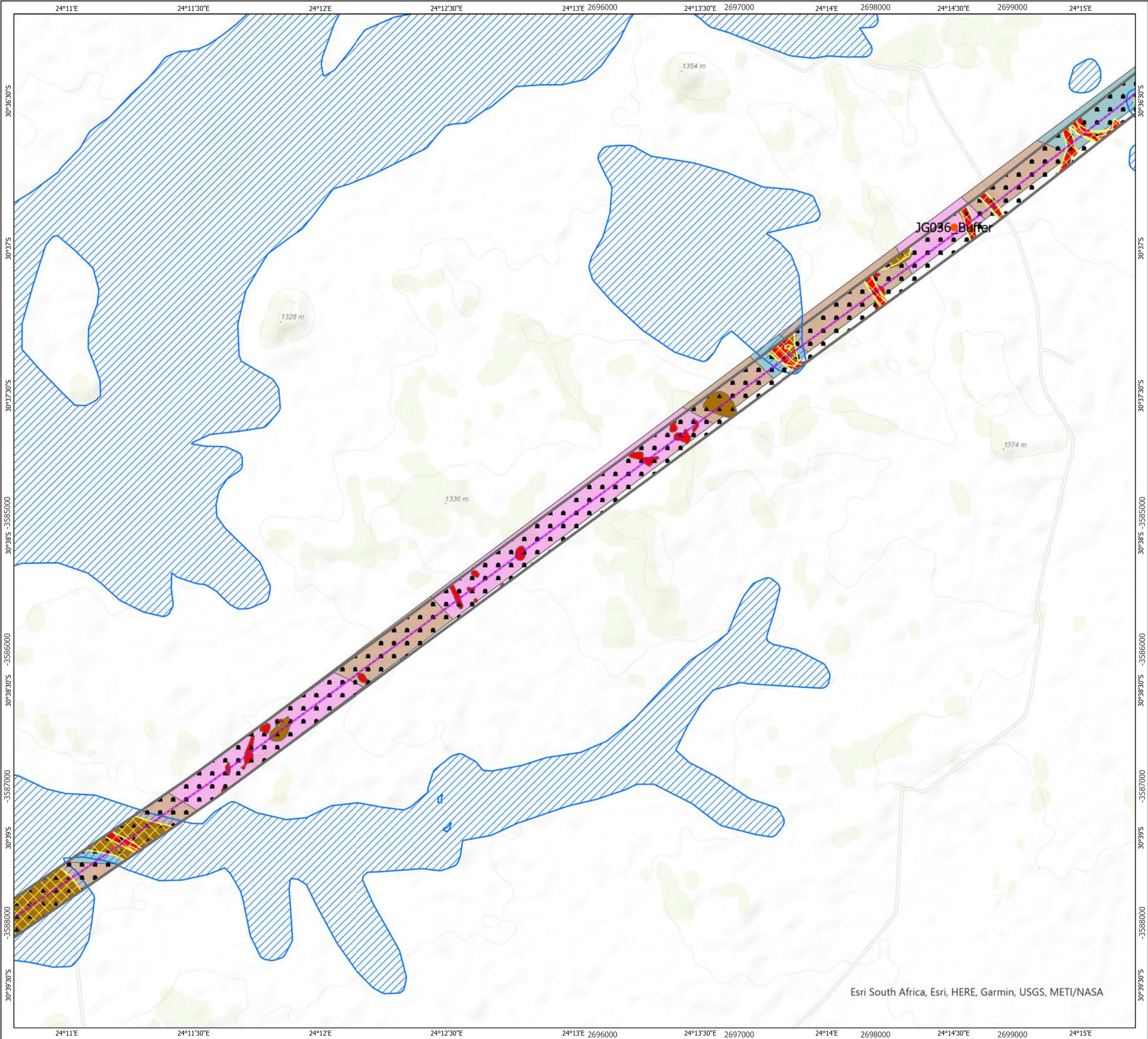
- Existing Eskom Hydra Substation
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)
- Proposed Switching Station
- 200 m Corridor Assessed
- Archaeological No-Go
- Archaeological Mitigation Area
- Medium Sensitivity Birds
- Low Sensitivity Birds
- Ecology High Sensitivity
- Ecology Medium Sensitivity
- Ecology Low Sensitivity
- Alluvial watercourses 48m buffer
- Wetland
- Dam
- Regulated 500m WUA zone
- Verreuxs Eagle Nest 500 m buffer
- Palaeontological Sensitivity
 - High
 - Low
 - Moderate
 - Very High



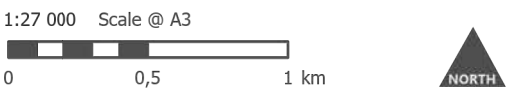
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Environmental Sensitivity Map Figure 11b

Basic Assessment Report De Aar 2 South Transmission Line and Switching Station



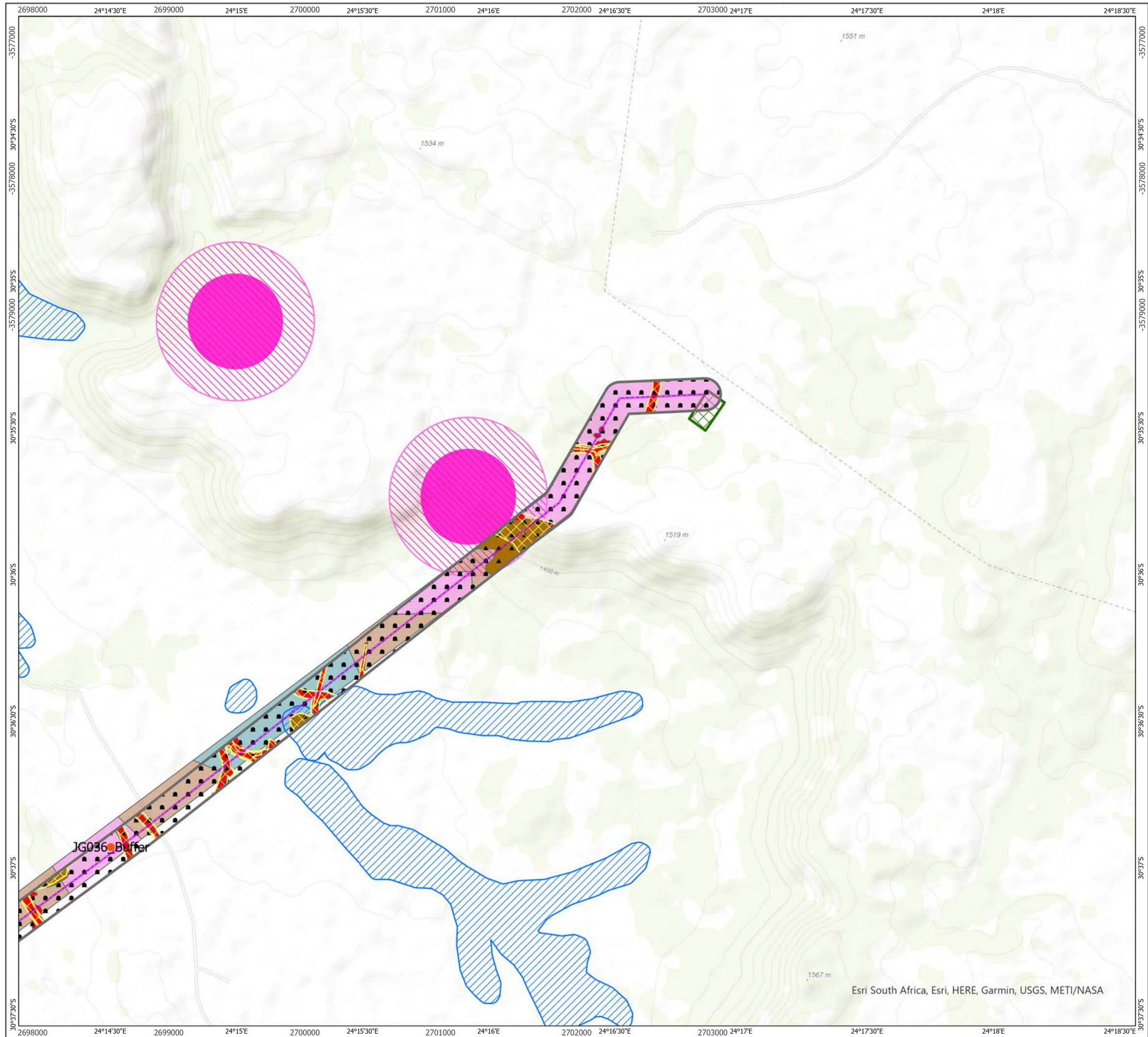
- Existing Eskom Hydra Substation
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)
- Proposed Switching Station
- 200 m Corridor Assessed
- Archaeological No-Go
- Archaeological Mitigation Area
- Medium Sensitivity Birds
- Low Sensitivity Birds
- Ecology High Sensitivity
- Ecology Medium Sensitivity
- Ecology Low Sensitivity
- Alluvial watercourses 48m buffer
- Wetland
- Dam
- Regulated 500m WUA zone
- Verreuxs Eagle Nest 500 m buffer
- Palaeontological Sensitivity
 - High
 - Low
 - Moderate
 - Very High



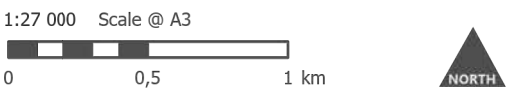
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Environmental Sensitivity Map
Figure 11c

Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station



- Existing Eskom Hydra Substation
- Proposed Transmission Lines
 - Route 1 (Preferred Alternative)
 - Route 2 (Part 1) (Alternative 1)
 - Route 2 (Part 2) (Alternative 1)
- Proposed Switching Station
- 200 m Corridor Assessed
- Archaeological No-Go
- Archaeological Mitigation Area
- Medium Sensitivity Birds
- Low Sensitivity Birds
- Ecology High Sensitivity
- Ecology Medium Sensitivity
- Ecology Low Sensitivity
- Alluvial watercourses 48m buffer
- Wetland
- Dam
- Regulated 500m WUA zone
- Verreuxs Eagle Nest 500 m buffer
- Palaeontological Sensitivity
 - High
 - Low
 - Moderate
 - Very High



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Environmental Sensitivity Map
Figure 11d

Basic Assessment Report
De Aar 2 South Transmission Line
and Switching Station