

DU PLESSIS DAM SOLAR PV1 GRID CONNECTION

**Switching Station and 132kV Powerline connecting the Du Plessis Dam Solar PV1
to the Mulilo Cluster 1 Substation, De Aar, Northern Cape Province**

Draft Basic Assessment Report

June 2022

Applicant

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List of Abbreviations

BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEFF	National Department of Environment, Forestry & Fisheries
DoE	Department of Energy
DSR	Draft Scoping Report
DWS	Department of Water & Sanitation
DMR	Department of Mineral Resources
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FBAR	Final Basic Assessment Report
GA	General Authorisation
GNR	Government Notice Regulation
ha	Hectare(s)
HIA	Heritage Impact Assessment
IAPs	Interested and Affected Parties
IEM	Integrated Environmental Management
m³	Cubic metres
Mamsl	Metres above mean sea level
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No 59 of 2008)
PIA	Palaeontological Impact Assessment
PPP	Public Participation Process/Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SR	Scoping Report
PHRA	Provincial Heritage Resources Authority
PoS	Plan of Study
SIP	Strategic Infrastructure Project
SOC	State Owned Company
SS	Substation
WUA	Water Use Authorisation
WULA	Water Use License Application

ENERGY & ELECTRICAL TERMS AND ABBREVIATIONS

ICNIRP	International Commission for Non-Ionising Radiation Protection
IEP	Integrated Energy Plan
IRP	Integrated Resource Plan
ISEP	Integrated Strategic Electricity Planning
MTS	Main Transmission System
NDP	Network Development Plan
NERSA	National Energy Regulator of South Africa
PV	Photovoltaic (Solar Panels)
REIPPP	Renewable Energy Independent Power Producer Procurement
RMIPPP	Risk Mitigation Independent Power Purchase Procurement

Voltage

kV	Kilovolt (1kV = 1 000V)
MVA	Mega Volt Ampère

Units of power

kW	Kilowatt (1kW= 1 000W)
MW	Megawatt (1MW=1 000kW)

DU PLESSIS DAM SOLAR PV1 GRID CONNECTION

Switching Station and 132kV Powerline connecting the Du Plessis Dam Solar PV1 to the Mulilo Cluster 1 Substation, De Aar, Northern Cape Province

EXECUTIVE SUMMARY OF THE DRAFT BASIC ASSESSMENT REPORT

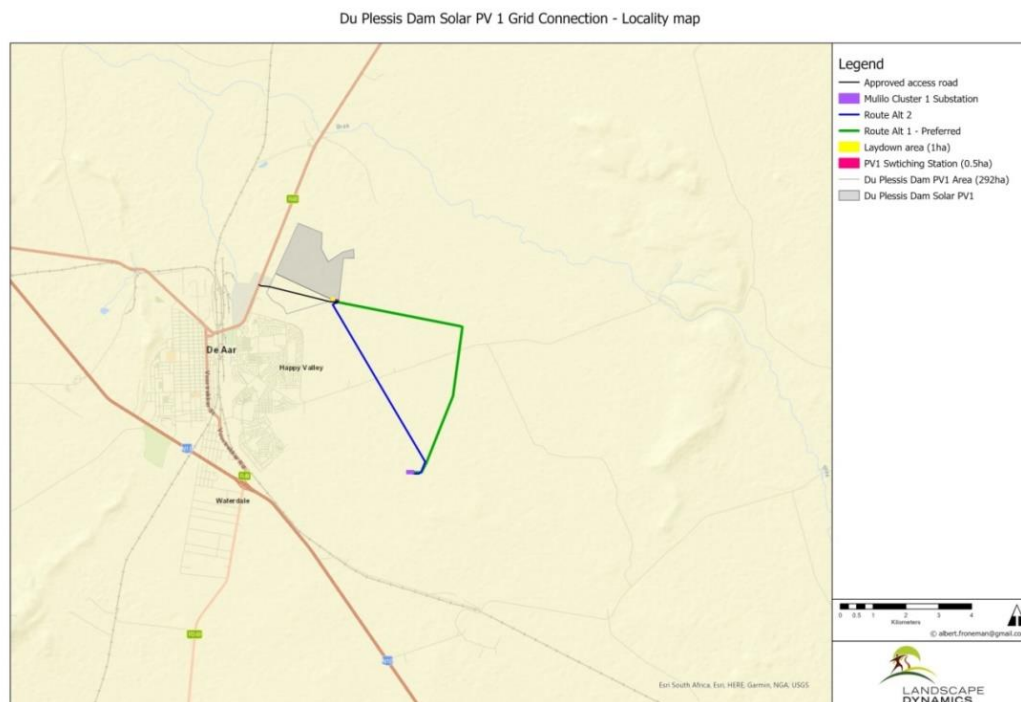
INTRODUCTION AND PURPOSE OF THE PROJECT

Du Plessis Dam Solar PV1 (Pty) Ltd (“the Applicant”) appointed Landscape Dynamics Environmental Consultants to apply for Environmental Authorisation for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of a switching station at the Du Plessis Solar PV1 as well as an approximate 7,6km 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation.

The Du Plessis Dam Solar PV1 Project received SIP 10 status in November 2021. It is also confirmed that the project will be submitted as part of the Renewable Energy IPP Procurement Programme Bid Window 5 (REIPP BW5); therefore the Department of Forestry, Fisheries & Environment (DFFE) is the Competent Authority for this project.

LOCALITY

The proposed grid connection (two alternatives have been assessed) is situated east of the town of De Aar, within the jurisdiction of the Emthanjeni Local Municipality, Northern Cape Province, situated between approximately 3km and 6km east of centre of De Aar in the Northern Cape Province.



The following farms are directly affected by the preferred route:-

- The Remainder of the Farm Du Plessis Dam No 179
- Portions 1 of the Farm De Aar 180
- Portions 4 of the Farm De Aar 180

PROJECT COMPONENTS

Infrastructure	Specifications
Powerline (Grid connection)	<ul style="list-style-type: none"> • 132kV S/C Overhead Power line will connect the Du Plessis Dam Solar PV1 Eskom Switching Station with the Mulilo Cluster 1 Substation • Length/Route is approximately 7.6km • Eskom Servitude width is 31m. • A 300m wide corridor was assessed • Associated infrastructure at the Overhead Power Line Route/Servitude: <ul style="list-style-type: none"> ○ Steel monopole structures ○ ACSR & OPGW Conductors ○ Foundations and Earthing ○ Line Hardware and Accessories
Access Roads	<ul style="list-style-type: none"> • ±2km, 12m wide access road <ul style="list-style-type: none"> ○ Starting point at the R48 and ends at the PV1 switching station ○ This access road is existing but will be widened to 12m ○ Road was authorised with the Du Plessis Solar PV1 application (DFFE Ref Nr 12/12/16/3/3/2/456) • ±6m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude
Switching Station	<ul style="list-style-type: none"> • 33/132kV switching yard • ± 0.5 hectares in size (50m x 100m) • Internal access roads of 6m wide <p>Associated infrastructure at the Switching Station</p> <ul style="list-style-type: none"> ○ Outdoor Mechanical-Electrical High Voltage Equipment ○ Indoor Medium Voltage Switchgear and Low Voltage Controlgear ○ Lighting Protection Equipment ○ Perimeter and internal Fencing ○ Buildings required for operation (i.e. ablutions required for maintenance staff)
Laydown area	<ul style="list-style-type: none"> • A construction site area of ±1 hectares directly adjacent to the PV1 Switching Station is required. • All temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Storage of diesel	<p>Diesel storage of less than 80m³ for the 132kV Switching Station:</p> <ul style="list-style-type: none"> ○ During construction, diesel is required for construction vehicles as well as generators for the construction camp and commissioning whilst waiting for the Eskom grid connection works to be completed ○ During operations, diesel is required for Operations & Maintenance vehicles at the PV plants but also required for backup diesel generators at the

	substations. The Generators supply auxiliary power to the substation's protection and communications systems, should there be outages on the grid. This is an Eskom requirement together with a battery room at the substations to act as UPS for these critical systems.
Temporary Services	During the construction phase, temporary sanitation facilities will be provided (i.e. chemical toilets) and these toilets will be regularly serviced by a licensed company.

LEGAL REQUIREMENT

National Environmental Management Act (Act 107 of 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr 326). Environmental Authorisation is requested for the following listed activities:

Listing Notice 1 (GN R327)		
Nr 11	The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33kV but less than 275 kilovolts.	A 132kV overhead power line will be constructed.
Nr 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for <ul style="list-style-type: none"> (i) The undertaking of a linear activity (ii) Maintenance purposes undertaken in accordance with a maintenance management plan. 	The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha.
Nr 28	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: <ul style="list-style-type: none"> (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial,	The switching station and grid connection will be constructed on a total area exceeding 1 hectare in extent outside the urban area of De Aar on agricultural land.

	industrial or institutional purposes.	
Listing Notice 3 (GN R324)		
4	The development of a road wider than 4 meters with a reserve less than 13,5metres in (g) the Northern Cape (ii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	<ul style="list-style-type: none"> • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
10	The development and related operation of facilities 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 in (g) the Northern Cape; in (iii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites <u>or 5 kilometres from any other protected area</u> identified in terms of NEMPAA or from the core areas of a biosphere reserve.	<ul style="list-style-type: none"> • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such vegetation is required for maintenance purposes undertaken in accordance with a management maintenance plan in (g) the Northern Cape within (ii) Critical Biodiversity Areas identified in bioregional plans	<ul style="list-style-type: none"> • The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha. • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2.

A Basic Assessment process is applicable for this application. The process is summarised below.

Screening

- Purpose: Confirm key site sensitivities relating to this project area
- DFFE Screening Tool Report & Verification Assessment
- Confirm specialist input
- Site visit

Public Participation Kick-Off

- Purpose: public participation in line with NEMA Regulations and obtaining public input/objections/concerns
- Compilation of IAP List
- Distribution of notification letters
- Onsite notifications
- Newspaper advertisements

Specialist Studies

- Desktop assessments
- Site investigations
- Impact Assessment Reports / Statement Letters

Draft Basic Assessment Report and Public participation

- Purpose: alternative assessment, responses to public input, impact assessment
- Compiled Draft Basic Assessment Report
- Distributed for a 30-day commenting period

We are here

Final Basic Assessment Report

- Purpose: Respond to public comment on the dBAR
- Incorporate comment into development proposal
- Finalise development proposal and layout
- fBAR may be distributed for a 30-day commenting period if substantial changes to the dBAR were made

Submission of Final Basic Assessment Report to DFFE

- Purpose: DFFE review for refusal / granting of Environmental Authorisation

Informing IAPs of the Environmental Authorisation

- Informing IAPs of the EA and their right to appeal
- 20-day appeal period

The National Water Act (Act No 36 of 1998)

All of the proposed activities are located some distance from significant delineated aquatic features and thus do not pose a risk of changing the bed, banks or characteristics of the watercourses or impede or divert flow in the watercourses; which implies that Section 21 (c) and (i) water use activities are not triggered. No water use authorisation is therefore required for the Du Plessis Dam PV1 Grid Connection.

The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities include the following:

- any development or other activity which will change the character of a site exceeding 5 000m² in extent
- linear developments of 300m or longer.

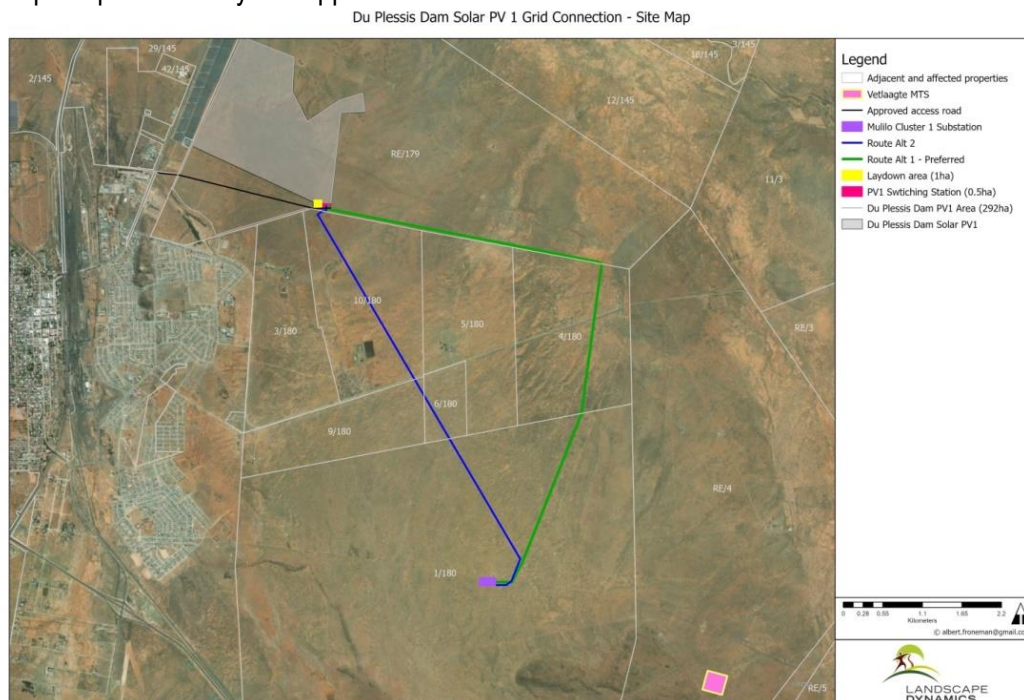
The SA Heritage Resources Agency is the commenting authority in this regard and their comment will be included and addressed in the Final BAR.

PURPOSE OF THE PROJECT

The need of the project relates directly to the need for renewable energy projects in South Africa. The proposed electrical infrastructure will connect the electricity to be generated by the Du Plessis Solar PV1 to the Mulilo Cluster 1 Substation to ultimately connect to the Eskom national grid.

ALTERNATIVES

The following two 132kV route alternative corridors had been assessed with the green route being the preferred option presented by the Applicant:



The following aspects regarding alternatives are applicable to this grid connection :

- Location*

The location of the grid connection is embedded in the grand design of the authorised solar Du Plessis Dam Solar PV1, which holds Environmental Authorisation valid until 28 September 2025. Changing the location of the switching station site at this stage would thus mean that the layout of the solar PV facility will have to be amended as well, which is not an option to consider due to unnecessary significant time and cost implications.

Both route corridors run along existing property boundaries and approved corridors which will necessary result in less impact on the environment. The preferred route has however been identified by Eskom as being their preferred option due to their future planning in the macro area. Note that the Environmental Authorisation will eventually be transferred to Eskom.

There is thus no justification and/or restrictions from both a technical and environmental point of view to change the position of the switching station site and/or preferred powerline route.
- Type of activity to be undertaken*

The energy generated by the Du Plessis Dam Solar PV1 needs to be evacuated and connected to the national grid. The only way of achieving this is by means of a switching station and a power line and no other type of activity could meet the purpose of this project.
- Design, technology and operational aspects*

The design, technology and operational aspects of switching stations/substations and power lines are guided strictly by Eskom standards, stipulations and requirements and it is not within the ambit of the Applicant to change Eskom standards.

**Summarised table of alternatives – preferences and restrictions
(to be considered with the specialist reports summarised below)**

Component	Route Alternative 1	Route Alternative 2
Technical Preference	Preferred	Acceptable
Terrestrial Ecological Impact	Alternative 1 is preferred	Acceptable
Avifauna impact	Alternative 1 is preferred	Acceptable
Aquatic environment	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Heritage Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Palaeontological Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Social Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference

PUBLIC PARTICIPATION

Notification letters were distributed to all Interested & Affected Parties (IAPs) and no objection to date was received. The Draft BAR (this document) is now being distributed for public review and input. Comment/objections received will be carefully assessed and addressed. The responses thereto will be included in the Final BAR. It is however not expected that objections will be received due to the numerous solar farm and associated infrastructure projects in the macro area.

DFFE SCREENING TOOL

The DFFE Screening Tool Report was compiled and site verification was done. Based on this screening report, specialist input and direct relevant experience from the EAPs specifically with regards to electrical infrastructure projects, it was concluded that the following specialist studies had to be undertaken:

- Fauna & Flora Impact Assessment
- Freshwater Impact Assessment
- Bird Impact Assessment
- Cultural Heritage Impact Assessment
- Palaeontological Assessment
- A Social Impact Assessment

SPECIALIST STUDIES

The switching station site, laydown area and a 300m power line route corridor were investigated by the specialist team (fauna & flora, aquatic, bird, social and heritage). These studies concluded that all expected negative impacts can be mitigated to acceptable levels. The preferred alternative is supported by all the specialists. The following is a summary of their key findings.

Terrestrial Ecological Specialist Assessment

- The regional vegetation type that occurs on site and in surrounding areas is not listed or of conservation concern.
- The corridors are both partially within a Critical Biodiversity Area 2 and partially within an Ecological Support Area (ESA), the latter of which extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project, and the CBA² area is the location of the associated solar PV project, which has already been authorised.
- No plant species of concern were found on site. One rare plant species, *Tridentea virescens*, could potentially occur in the general area but was not seen. It occurs across a very wide geographical area and loss of a small area of habitat will not affect the species.
- One protected amphibian, the Giant Bullfrog (*Pyxicephalus adspersus*), was found on site. The observation was within the Alternative 2 corridor in a specific location where it is likely to be resident. Loss of a small area of habitat for the proposed projects will not adversely affect the species, but it would be preferable to avoid impacts, if possible. From this perspective, Alternative 1 (preferred) is therefore marginally preferred here.
- Impacts of the proposed project components are relatively insignificant in comparison to the variety of approved solar PV projects within the immediate surroundings.

The following recommendations were made to protect and enhance sensitive ecological features on site, which occur outside the proposed footprint areas:

- The small depressions within the Alternative 2 corridor on site should be treated as moderately sensitive. Measures should be implemented to protect these areas from direct impacts.
- Alien invasive species must be strictly managed.

Aquatic Specialist Impact Assessment

The proposed grid connection and switching station for PV1 are located outside of the wider floodplain area of a Brak River Tributary that lies to the north-east and east of the project activities. Some minor watercourses of low ecological sensitivity occur near the route that is of low sensitivity and have poorly defined channels and little associated aquatic habitat and biota. The proposed activities are thus unlikely to have any impact on these aquatic features.

A small dam has been constructed along the eastern side of the proposed PV1 grid connection route corridor that is mapped as a FEPA wetland and has some associated artificial wetland habitat. Considering that the wetland habitat is artificial, associated with a constructed dam and along a gravel farm access road, as well as the fact that the proposed powerline can easily span the feature, no aquatic ecosystem are any significance are likely to be associated with the proposed activity at the dam.

The potential aquatic biodiversity impacts of the proposed activities are likely to be negligible in terms of any potential impact to aquatic habitat, biota, water quality, or flow for all phases of the proposed development.

Both route alternatives assessed would have same potential aquatic ecosystem impacts that are of negligible significance.

Avifauna Specialist Impact Assessment

The total area of habitat destruction associated with the footprint of the grid connection and associated infrastructure is relatively small compared to the proportion of habitat available in the area, and does not represent a fatal flaw that would prevent the proposed development from proceeding. As the majority of the proposed power line corridors assessed run adjacent to existing power lines, which are largely 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 and could potentially reduce the overall risk to birds.

The proposed project is unlikely to impose significant impacts on the avifauna of the receiving environment. No significant negative impacts have been identified and therefore the project can be authorised from an avifaunal perspective.

Heritage Impact Assessment

Three sites of mixed age scatters of hornfels flaked artefacts were identified – one along the preferred corridor and two along the 2nd corridor alternative. They are however of very low significance and do not require any mitigation.

The landscape was found to be heavily dominated by existing electrical infrastructure which forms a new layer on the landscape. The new developments will thus be in keeping with this land use and will not introduce any new or significant impacts.

It is recommended that the proposed powerlines, switching stations and access roads be authorised (using either alternative in the case of PV1), but subject to the following recommendations which should be included as conditions of authorisation:

- Surface clearance is to be kept to the minimum required for the project; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Palaeontological Impact Assessment

Based on the geology of the area and the palaeontological record, it can be justified that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through in April 2022 confirmed that there are only a few scattered fragments of transported silicified fossil wood. The sands of the Quaternary period would not preserve fossils. It is not known if there are fossils below the ground surface.

Based on the fossil record but confirmed by the site visit and walk through there are only a few scattered pieces of transported silicified fossil wood even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the shales of the Tierberg and the Abrahamskraal Formations so a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the environmental officer or other responsible person once excavations and drilling have commenced, it should be rescued and a palaeontologist called to assess and collect a representative sample.

Social Impact Assessment

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

The key positive social impact associated with the project is the creation of employment and business opportunities, as well as the opportunity for skills development and on-site training.

The findings of the study indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Du Plessis Dam Solar PV1 overhead power line is *Low Negative* with mitigation. This applies to both Alternative 1 (Preferred Alternative) and Alternative 2.

The energy security benefits associated with the proposed Du Plessis Dam Solar PV1 are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The establishment of proposed 132 kV grid connection for the Du Plessis Dam PV1 is therefore supported by the findings of the Social Impact Assessment.

PUBLIC PARTICIPATION

The public participation process followed was approved by the DFFE on 11 February 2022 and the following actions were taken to date:

- Three A2 laminated onsite notices were placed at strategic places in close proximity to the site on 22 February 2022.
- A newspaper advertisement was placed in a local newspaper on 25 February 2022.
- A notification letter with a request for input was sent to everyone on the IAP Register on 2 March 2022 and a 30-day commenting period (exclusive of official public holidays) applied.
- The Draft BAR (this document) has now been submitted to the DFFE and I&APs on 16 June 2022 for a 30-day commenting period (exclusive of public holidays).

Comment received on this application will be included and addressed in the Final BAR.

IMPACT ASSESSMENT

The main potential negative impacts associated with the project are the following:

Expected Negative Impacts

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment

- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

It was concluded in the Environmental Impact Assessment table included in the Draft BAR that, after the application of proposed mitigation measures, all negative impacts can be mitigated to acceptable levels.

Expected positive impacts

- The Du Plessis Solar PV1 Grid Connection will allow the electricity generated by the Du Plessis Dam Solar PV1 to be evacuated into the national grid.
- All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will be realised. An opportunity to reduce South Africa's very high carbon emissions will be utilised.
- Employment and business opportunities with the opportunity for skills development and on-site training will be created through the establishment of the Du Plessis Dam Solar PV1 facility which include the proposed grid connection.

ENVIRONMENTAL IMPACT STATEMENT

The following is concluded:-

- The proposed Du Plessis Dam Solar PV1 Grid Connection is planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account.
- All relevant legal requirement in terms of the Environmental Impact Assessment Regulations published in 2014, as amended were complied with. This Basic Assessment Report includes all relevant proceedings, findings and recommendations which resulted from this study.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area, identifying potentially sensitive areas and issues of concern as well as identifying impact that require re-consideration of alternatives.
- Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. No objections had been received regarding this project.
- The infrastructure and preferred alternative as motivated and recommended for authorisation in this document will, after the application of mitigation measures, have a minimal and acceptable impact on the environment. This will be accomplished through the implementation of the mitigation measures

specified in the Environmental Management Programme (EMPr) that is included as Appendix G of the Basic Assessment Report.

- The EAPs are confident that the infrastructure and preferred route alternative as presented is acceptable and viable. The assessment of additional alternative sites and/or routes is not justified.
- There is no reason from a technical, environmental and social perspective why the preferred powerline corridor could not be authorised.

RECOMMENDATIONS

It is recommended that Environmental Authorisation be granted to the **Du Plessis Dam Solar PV1 (Pty) Ltd** for the preferred route for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of a switching station with associated infrastructure (inclusive of a diesel storage facility) and an approximate 8km 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation.

It is required that the following be considered for inclusion in the Environmental Authorisation:

- A power line route corridor of 300m was assessed and it is requested that the *corridor* be approved as part of the environmental authorisation and not the servitude only. This will allow for reasonable adjustments within the corridor during the final design phase of this project without having to go through another environmental authorisation process. Only the required 31m wide servitude will be registered within the route corridor, not the entire corridor.
- It is required that the Site-Specific Environmental Management Programme be approved as part of the Environmental Authorisation.
- The Environmental Authorisation must be valid for a period of 10 years.

CHAPTER 1: INTRODUCTION

1.1 Background

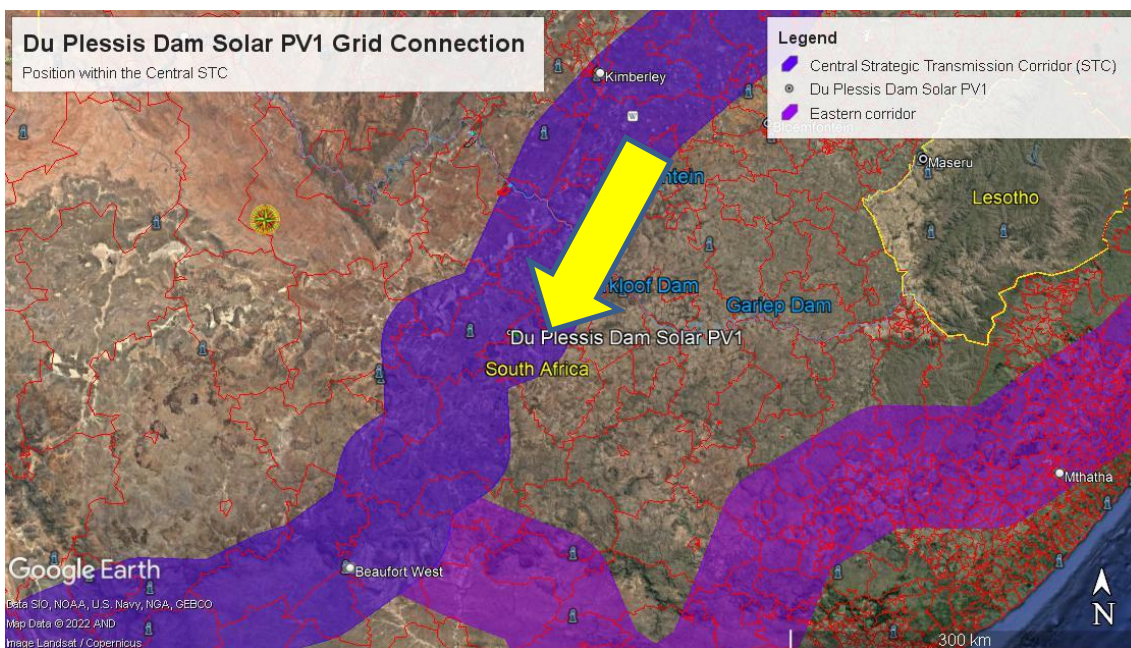
Du Plessis Dam Solar PV1 (Pty) Ltd (“the Applicant”) has appointed Landscape Dynamics Environmental Consultants to apply for Environmental Authorisation for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of an approximate 8km, 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation. .

The electrical infrastructure will be handed over to Eskom after construction. This includes the transferring of rights and obligations of the Environmental Authorisations and the approved Environmental Management Programme.

The Du Plessis Dam Solar PV1 Project received SIP 10 status in November 2021. It is also confirmed that the project will be submitted as part of the Renewable Energy IPP Procurement Programme Bid Window 5 (REIPP BW5); therefore the Department of Forestry, Fisheries & Environment (DFFE) is the Competent Authority for this project. The SIP confirmation letter is attached as Appendix H(1).

Government Gazette 41445, Notice Number 113 of 16 February 2018 identified **Strategic Transmission Corridors (STCs)**. Electrical infrastructure projects falling within a STC is subject to the reduced timeframe of 57 days, instead of 107 days, in which DFFE has to issue/refuse the EA.

However, the EGI gazette requirements are at this stage only applicable to projects which trigger Activity 9 of Listing Notice 2. Even though this Du Plessis Dam Solar PV1 Grid Connection falls within a STC, Activity 9 of Listing Notice 2 is not applicable and it therefore does not qualify as an EGI project. The DFFE decision-making timeframe would therefore have been 107 days, but due to it being a SIP project the decision-making timeframe of 57 days still applies.



1.2 The Basic Assessment Report

1.2.1 Objectives of the Basic Assessment Report

According to the NEMA Regulations' Appendix 1, the objective of the environmental impact assessment process is to, through a consultative process

- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b) identify the alternatives considered, including the activity, location, and technology alternatives;
- c) describe the need and desirability of the proposed alternatives;
- d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated; and
- e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

1.2.2 Content of the Basic Assessment Report

According to the NEMA 2014 Regulations (as amended in April 2017), Appendix 1, Section 3, the Basic Assessment Report must contain the information that is necessary for the competent authority to consider and come to a decision on the application. The items are listed below with appropriate reference to the relevant Chapters in the BAR where the item is addressed.

Regulation Requirement	Section in BAR where addressed
(a) details of <ol style="list-style-type: none">(i) the EAP who prepared the report; and(ii) the expertise of the EAP, including a curriculum vitae;	Chapter 1, Paragraph 1.5 Appendix h
(b) the location of the activity, including: <ol style="list-style-type: none">(i) the 21 digit Surveyor General code of each cadastral land parcel;(ii) where available, the physical address and farm name;(iii) where the required information in items (i) and (ii) is not available, the	Chapter 2, Paragraph 2.2

coordinates of the boundary of the property or properties;	
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 2, Paragraph 2.2 Chapter 2, Paragraph 2.2; 2.3 and 2.4 Appendix A(1), A(2) and D(2)
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Chapter 1, Paragraph 1.3.1 Chapter 2, Paragraph 2.4
(e) a description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation (iii) and policy context, plans, guidelines, tools frameworks, and instruments;	Chapter 1, Paragraph 1.3 Chapter 2, Paragraph 2.1
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 2, Paragraph 2.1
(g) a motivation for the preferred site, activity and technology alternative;	Chapter 3 and Chapter 4
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified for each alternative, including the nature,	Chapter 3 Chapter 3 Chapter 5, Paragraph 5.2 Chapter 5, Paragraph 5.3 and 5.4 (in the Final BAR) Chapter 4

<p>significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts—</p> <ul style="list-style-type: none"> (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; <p>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</p> <p>(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;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	<p>Chapter 6 Paragraph 6.4.2</p> <p>Chapter 6, Paragraph 6.4.1</p> <p>Chapter 6, Paragraph 6.1</p> <p>Chapter 6, Paragraph 6.4.2 and 6.4.3 and Appendix G</p> <p>Chapter 4, Paragraph 4.5 Chapter 6, Paragraph 6.5.1</p>
<p>(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—</p> <ul style="list-style-type: none"> (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; 	<p>Chapter 6, Paragraph 6.1</p> <p>Chapter 6, Paragraph 6.4 Chapter 6, Paragraph 6.4</p>
<p>(j) an assessment of each identified potentially significant impact and risk, including—</p> <ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated; 	<p>Chapter 6, Paragraph 6.4</p>
<p>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations</p>	<p>Chapter 4, Paragraphs 4.2 & 4.3</p>

and an indication as to how these findings and recommendations have been included in the final report;	Appendix G
(l) an environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 7, Paragraph 7.2
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Chapter 6 Paragraphs 6.4.2 and 6.4.3
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 7, Paragraph 7.5
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 7.1 and included in specialist reports in Appendix E
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 7, Paragraph 7.3
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Chapter 7, Paragraph 7.4
(r) an undertaking under oath or affirmation by the EAP in relation to (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Chapter 7, Paragraph 7.5
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable

(t) any specific information that may be required by the competent authority; and	To be included in the Final BAR, Chapter 5, Paragraph 5.4
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	Not applicable

1.3 Legal Requirement

1.3.1 National Environmental Management Act (Act 107 of 1998)

This application is done in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014, as amended in April 2017 (Government Notice Nr 326). Environmental Authorisation is requested for the following listed activities:

Listing Notice 1 (GN R327)		
Nr 11	<i>The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33kV but less than 275 kilovolts.</i>	A 132kV overhead power line will be constructed.
Nr 27	<i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for</i> (iii) <i>The undertaking of a linear activity</i> (iv) <i>Maintenance purposes undertaken in accordance with a maintenance management plan.</i>	The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha.
Nr 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:</i> (iii) <i>will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or</i> (iv) <i>will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;</i> <i>excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.</i>	The switching station and grid connection will be constructed on a total area exceeding 1 hectare in extent outside the urban area of De Aar on agricultural land.

Listing Notice 3 (GN R324)		
4	<i>The development of a road wider than 4 meters with a reserve less than 13,5metres in (g) the Northern Cape (ii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</i>	<ul style="list-style-type: none"> • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
10	<i>The development and related operation of facilities 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 in (g) the Northern Cape; in (iii) outside urban areas in (ee) Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; and in (gg) areas within 10 kilometres from national parks or world heritage sites <u>or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.</u></i>	<ul style="list-style-type: none"> • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2. • There is a protected area, the De Aar Nature Reserve, approximately 4,5km west of the proposed development site.
12	<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such vegetation is required for maintenance purposes undertaken in accordance with a management maintenance plan in (g) the Northern Cape within (ii) Critical Biodiversity Areas identified in bioregional plans</i>	<ul style="list-style-type: none"> • The switching station site with the adjacent laydown area will result in the clearing of an area of approximately 1,5ha. • The switching station, laydown area and northern sections of the powerline route alternatives fall within a Critical Biodiversity Area 2.

NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.

NEMA principles serve as:

- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

NEMA principles are the following:

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

Chapter 2 of NEMA

Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account.

The NEMA principles with which this application conforms are described as follows —

1. Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
2. Development must be socially, environmentally and economically sustainable.
3. Sustainable development requires the consideration of all relevant factors.

The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

Section 23 of NEMA

The stated objectives of Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved. The goals are to

- a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;
- b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic

conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;

- c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;
- d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;
- e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and
- f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:

- a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.
- b) Impacts have been described, assessed and mitigation measures have been supplied in order to ensure that all identified impacts are mitigated to acceptable levels. Alternatives have been thoroughly assessed and the best possible solution represents this development proposal.
- c) The development proposal has to be evaluated and approved by DEFF and no construction may commence prior to the issuing of the Environmental Authorisation.
- d) The procedures which were followed during the public participation programme were based on the NEMA EIA Regulations, December 2014, as amended in April 2017.
- e) DEFF will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.
- f) The mitigation measures as supplied in this report together with the measures as per the Environmental Management Programme are deemed to be the best way to manage anticipated impacts.

By providing electricity whilst not impacting negatively on the environment, this project would contribute to a sustainable environment.

1.3.2 The National Water Act (Act No 36 of 1998)

The National Water Act (NWA) guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources. The Department of Water & Sanitation (DWS) is the administering body in this regard.

All of the proposed activities are located some distance from significant delineated aquatic features and thus do not pose a risk of changing the bed, banks or characteristics of the watercourses or impede or divert flow in the watercourses; which implies that Section 21 (c) and (i) water use activities are not triggered. No water use authorisation is therefore required for the Du Plessis Dam PV1 Grid Connection.

1.3.3 The National Heritage Resources Act (Act 25 of 1999)

The proposed project falls within the scope of Section 38 of the National Heritage Resources Act and the applicable activities are:

- any development or other activity which will change the character of a site exceeding 5000m² in extent
- linear developments of 300m or longer.

The authorisation process in terms of the NHRA forms part of the EIA process. A Heritage Impact Assessment was electronically submitted to the South Africa Heritage Resource Agency (SAHRA) via SAHRIS as well as to the Northern Cape Provincial Heritage Resources Authority as part of the public participation programme. Their comment / concerns will be addressed in the Final BAR.

1.3.4 The Occupational Health and Safety Act, 1993 (Act 181 of 1993)

The purpose of the Act is “to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith”.

A Safety Officer must be appointed by the Applicant who must at all times ensure that the safety and operation of the electrical installations and diesel storage facility comply with the requirements for health and safety as prescribed in the Occupational Health and Safety Act (OHS), 1993 (Act Nr. 181 of 1993), as amended.

1.3.5 Additional Acts, Frameworks and Guidelines

Pixley Ka Seme District Spatial Development Framework/ Land Development Plan 2013-2018

Provincial Development Regions and Corridors

Settlement patterns in the province are informed by economic development opportunities. Specific economic development regions and corridors developed over time responding to:

- a) environmental capital (soil potential, availability of water, minerals, etc.), and
- b) infrastructural capital (roads, bulk engineering infrastructure, electricity).

Development regions and corridors are formed by the clustering of nodes where the capacity of entities and stakeholders within these nodes are coming together to ensure leadership and institutional capacity to constitute regional equity. One of the development regions and corridors in the Northern Cape is the SOLAR CORRIDOR, which is a corridor stretching from Upington to Kakamas in the north to De Aar in the east.

SDF strategic focal points and priorities

One of the directives for the district is to support and focus development and investment along the identified Development Corridors. This project falls within the Solar Corridor and the electrical infrastructure that will be constructed will be to feed electricity generated by the solar PV plants into the national grid. The proposed site is situated in relative close proximity to the N10 highway and thus also falls in the N10 Development Corridor.

Transport

The N10 is a major transport link between the Siyanda and Pixley Ka Seme District municipalities. It provides links between the Eastern Cape and Western Cape to Namibia with the potential for tourism and development. The areas along the N10 also provide a Solar corridor link between the two municipal areas.

Renewable Energy Hub

The Pixley Ka Seme District area with its abundance of sunshine and vast tracts of available land has been attracting considerable interest from solar energy investors. The high solar index of the area, as indicated by the Solar Index Diagram, provides many opportunities in terms of the development of renewable energy.

This was also acknowledged by the Northern Cape Government with the identification of the Renewable Energy Hub. The areas around the northern and eastern borders of the Pixley Ka Seme District Municipality, with a distance of 50 kilometres from the Orange River, forms part of this hub with the potential to stimulate special economic development zoned within the area that have the potential to stimulate industrial development.

The Pixley ka Seme District Municipality proactively took bold steps towards diversification of the District economy from one that relies on mining and agriculture. The *Pixley ka Seme District 2010 Investment and Renewable Energy Conference* was an important milestone aimed at 92 'Setting the District on a Growth Path' through innovative local economic development initiatives. The gains made in this emerging sector are a product of committed political and administrative leadership from District and local municipalities. Taking a bird's eye view of the District, Pixley managed to declare itself as a Renewable Energy Hub seeking to attract foreign direct investments into solar, wind, hydro and Biomass projects.

De Aar

De Aar is the capital of the Pixley Ka Seme District Municipality and the third largest town in the Northern Cape. It is centrally located regarding main railway lines between Johannesburg, Cape Town, Port Elizabeth and Namibia as well as tarred roads to surrounding towns. The railway junction was the second most important junction in South Africa, including 110km of railway lines and 29 rail-tracks.

De Aar is identified as the Urban Centre within Emthanjeni municipal area and also known as the main administration centre located on the N10 national route linking Namibia with the coastline of Port Elizabeth. De Aar is the third largest town in the Northern Cape and the name refers to underground water arteries with 69 boreholes supplying water to the town.

Solar projects with its associated infrastructure (electrical infrastructure to supply the national grid in the case of this project) constructed at the proposed development site is in line and in support of the economic planning and growth visions of the district as well as the town of De Aar.

Pixley Ka Seme District Municipality Integrated Development Plan 2017 - 2022

The economy in the Pixley ka Seme municipal area is characterised by, amongst other, the potential and impact of renewable energy resource generation. At least 20 000MW of renewable energy should be contracted by 2030 to be in support of the envisioned outcome of provincial environmental sustainability and resilience.

The favourable conditions for renewable energy generation are listed as a possible competitive advantage for the Municipality. The development of solar and wind farms is also listed as an *Opportunity* in the Municipal SWOT analysis (Strengths, Weaknesses, Opportunities, Threats). The strategic nature of the local resources is beneficial to serve as the catalyst for investment and identified development corridors should be explored to unlock the economic potential of not only the district, but also the Northern Cape Province.

The growth and development context in the district has also changed radically since 2013 (after it had been stagnant for decades) owing mainly to private and public investments in the area as a hub for renewable energy generation and astronomy, respectively.

A strategic objective of the District Municipality is to promote economic growth and to support the local municipalities in doing so. Allowing investment in renewable energy resource generation is definitely in support of the objective.

The development of electrical infrastructure as proposed will be in full support of the development and economic strategies as compiled in the IDP.

Environmental Management Framework(s)

The DFFE Screening Tool (attached in Appendix B) could not find any intersection with Environmental Management Frameworks relevant to this application.

Additional Relevant Legislation and Standards

Title of legislation, policy or guideline	Applicability to Project	Regulating authority
National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations published in Government Notice No. R.982, December 2014, as amended in April 2017	Authorisation is required – refer to Paragraph 1.3.1 above	National Department of Environmental Affairs
The National Water Act, 1998 (Act No 36 of 1998)	Water use authorisation is not required– refer to Paragraph 1.3.2 above	The Department of Water and Sanitation
National Heritage Resources Act, (NHRA), (Act 25 of 1999)	Comment must be obtained – refer to paragraph 1.3.3 above	South African Heritage Agency (SAHRA) and Limpopo HRA
National Environmental Management: Biodiversity Act (Act no 10 of 2004), (NEMBA)	Authorisation is not required.	National Department of Environmental Affairs
National Environmental Management: Waste Act (Act No. 59 of 2008) 2008	Authorisation is not required	Department of Environmental Affairs
Mineral and Petroleum Resources Development Act (No 28 of 2002)	Authorisation is not required	Department of Mineral Resources
Conservation of Agricultural Resources Act (43 of 1983)	Authorisation is not required	Department of Agriculture
National Forests Act (No 84 of 1998) and Government Notice 1339 of 6 August 1976	Authorisation for the removal of protected flora is not required,	Department of Agriculture, Forestry and

(promulgated under the Forest Act (No 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants	since no protected species were identified within the two route corridors assessed.	Fisheries
Fencing Act (No 31 of 1963): Amended by the Agricultural Laws Rationalisation Act, Act No 72 of 1998	Authorisation is not required	South African Government
<u>South African National Standard</u> Civil Engineering Standards and Publications	To be implemented in the design, construction and operational phases of the project.	South African Bureau of Standards
National Development Plan (NDP) (2030)	To be considered	SA National Government

1.4 DFFE Screening Tool

The Screening Tool Report is attached as Addendum B(1).

Environmental Sensitivities

The Screening Tool Report dated 13 June 2022 identified certain Environmental Sensitivities within the proposed development area. These identified sensitivities are indicative only and verification was done by the EAPs and the relevant specialists.

Verification of the DFFE Screening Tool Report

Impact Assessment	Motivation
Agricultural Theme <i>Classification in terms of the Screening Tool:-</i> <i>High Sensitivity</i>	Agricultural Compliance Statements for grid connections undertaken by Mr Johann Lanz in the macro area confirmed that the agricultural impact and the amount of agricultural land loss resulting from the development (linear development mostly along existing and/or approved infrastructure routes) is insignificant in the context of the agricultural environment. No agricultural specialist input is proposed.
Animal Species Assessment <i>Classification in terms of the Screening Tool:-</i> <i>High Sensitivity</i>	<i>A Terrestrial Ecological Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E of this Report.
Aquatic Biodiversity Impact Assessment <i>Classification in terms of the Screening Tool:-</i> <i>Very High Sensitivity</i>	<i>An Aquatic Impact Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E of this Report.
Archaeological and Cultural Heritage Impact Assessment <i>Classification in terms of the Screening Tool:-</i> <i>Very High Sensitivity</i>	<i>An Archaeological Impact Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E of this Report. Further information in this regard will be provided if requested by SAHRA.

<p>Civil Aviation Assessment <i>Classification in terms of the Screening Tool:-</i> High Sensitivity</p>	<p>The SA Civil Aviation Authority (CAA) was approached for comment during the public participation process.</p> <p>It was confirmed that the relevant obstacle approval was already granted to the Du Plessis Dam Solar PV1.</p>
<p>Defence Theme <i>Classification in terms of the Screening Tool:-</i> Very High Sensitivity</p>	<p>The closest defence facility to the site is the South African Defence Department Ammunition Depot and School of Munitions, De Aar. This is situated 3,8km west of De Aar. The De Aar Military Airport is located 8,6km west of De Aar. The proposed grid connection which lies approximately between 3km and 6 km <u>east</u> of De Aar will not impact on this facility.</p> <p>No specialist input is recommended.</p>
<p>Palaeontology Theme <i>Classification in terms of the Screening Tool:-</i> High Sensitivity</p>	<p>A <i>Palaeontological Impact Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E. Further information in this regard will be provided if requested by SAHRA.</p>
<p>Plant Species Theme <i>Classification in terms of the Screening Tool:-</i> Medium Sensitivity</p>	<p>A <i>Terrestrial Ecological Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E of this Report.</p>
<p>Terrestrial Biodiversity Theme <i>Classification in terms of the Screening Tool:-</i> Very High Sensitivity</p>	<p>A <i>Terrestrial Ecological Assessment</i> was done and is summarised in Chapter 4 and included under Appendix E of this Report.</p>

Based on the DFFE Screening Tool Report, the site verification, specialist input **and direct relevant experience from the EAPs specifically with regards to electrical infrastructure that includes substations and powerlines**, it was concluded that the following specialist studies were required for the project:-

- Fauna & Flora Impact Assessment
- Freshwater Impact Assessment
- Bird Impact Assessment
- Cultural Heritage Impact Assessment
- Palaeontological Assessment
- A Social Impact Assessment

1.5 Details and Expertise of the Environmental Assessment Practitioner

Landscape Dynamics CC is the Environmental Consultants appointed for this project. Landscape Dynamics is an environmental consultancy firm established in May 1997. The main line of business since that time up to the present is the compilation of environmental impact assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 25 years of professional services supplied. The operating base for Landscape Dynamics is the entire South Africa; with offices and/or local representation in Gauteng, the Western Cape, Mpumalanga and Kwa-Zulu Natal.

The Environmental Assessment Practitioners (EAPs) for this project are Ms Annelize Erasmus and Ms Susanna Nel. Both EAPs are registered with EAPASA. The Landscape Dynamics Company Profile with the relevant condensed Curriculum Vitae's is attached in Appendix H(1).

1.6 Project Team

The impact that this project might have on the environment can only be effectively assessed if all the environmental project components are satisfactorily identified and considered. A multi-disciplinary approach is therefore required for this basic Environmental Impact Assessment process.

The EIA Project Team members are the following (Company Profile and CV's of the EAPs as well as the Declaration of Interest of the specialists are attached in Appendix H(2) and H(3) respectively:

Company Name	Contact Person(s)	Responsibility and/or Project Component
Landscape Dynamics Environmental Consultants	Ms Annelize Erasmus Ms Susanna Nel	EIA Project Management EAPs
David Hoare Consulting (Pty) Ltd	Dr David Hoare	Fauna & Flora Impact Assessment
BlueScience (Pty) Ltd	Dr Toni Belcher	Aquatic Impact Assessment
ASHA Consulting (Pty) Ltd (Pty) Ltd	Dr Jayson Orton	Heritage Impact Assessment
Prof Marion Bamford Palaeo-botanist	Prof Marion Bamford	Palaeontological Assessment
Arcus Consultancy Services South Africa (Pty) Ltd	Dr Owen Davies Ms Ashlin Bodashing	Avifauna Impact Assessment
Tony Barbour Environmental Consulting And Research	Mr Tony Barbour	Social Impact Assessment
Afrimage Photography	Mr Albert Froneman	Mapping and GIS support

The EIA Project Team is supported by the following team members from within Mulilo Renewable Project Developments (Pty) Ltd, on behalf of the Du Plessis Dam Solar PV1 (Pty) Ltd (the Applicant):

Contact Person	Responsibility and/or Project Component
Mr Warren Morse	Director: Solar & Energy Storage
Mr Andrew Pearson	Environmental Manager
Mr Ryan David Anderson	Permitting Manager
Mr Lloyd Barnes	Junior Permitting and Environmental Manager
Mr Johan Janse van Rensburg	Project Engineer

Mr Gerhard Mc Namara	Project Engineer
Mr Constantin Hatzilambros	Project Manager

1.7 Working Programme

Activity	Date
Date of Site Visit by Landscape Dynamics	February 2022
Date specialist studies completed and submitted	April & May 2022
Public Participation & advertising	
<ul style="list-style-type: none"> • Placement of newspaper ads 	25 February 2022
<ul style="list-style-type: none"> • Placement of onsite ads 	22 February 2022
<ul style="list-style-type: none"> • Distribution of First Notification Letter 	2 March 2022
<ul style="list-style-type: none"> • Draft BAR sent to IAPs (30 day-commenting) 	16 June 2022 – final date for comment is 17 July 2022.
Submission of Draft BAR and Application Form to DFFE	17-19 June 2022 (latest date for comment is 20 July 2022)
Submission of Final BAR to DFFE	22-25 July 2022
Date EA received (57 days decision making time frame)	22 September 2022
Notification to all I&AP's of EA and right to appeal	22 September 2022

CHAPTER 2: PROJECT INFORMATION

2.1 Need and Desirability

NEED

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the **National Development Plan (NDP)**, New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

The energy security benefits associated with the proposed Du Plessis Dam Solar PV1 are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The Du Plessis Dam Solar PV1 Project received SIP 10 status in November 2021. It is also confirmed that the project will be submitted as part of the **Renewable Energy IPP Procurement Programme Bid Window 5 (REIPP BW5)**; therefore the DFFE is the Competent Authority for this project.

The need for the project can further be justified when reviewing the South African **Integrated Resource Plan (IRP) 2019** which was gazetted by the Minister of Mineral Resources and Energy on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030. It basically involves an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. The IRP 2019 further states the following on renewables:

- “South Africa continues to pursue a diversified energy mix that reduces reliance on a single or a few primary energy sources. The extent of decommissioning of the existing coal fleet due to end of design life, could provide space for a completely different energy mix relative to the current mix. In the period prior to 2030, the system requirements are largely for incremental capacity addition (modular) and flexible technology, to complement the existing installed inflexible capacity.
- Renewable Energy: Solar PV and wind facilities present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.”

DESIRABILITY

The following tables address further issues as highlighted in the DFFE Need & Desirability Guidelines (2014).

Is this project part of a national programme to address an issue of national concern or importance?
<i>Reliable, consistent power supply is a major concern in South Africa, and the project will contribute towards much needed electricity supply. Furthermore, the electricity grid has become extremely constrained in the Northern Cape which is preventing more renewable energy projects coming online in areas with favourable resources. This has multiple direct negative impacts to the country being,</i> <ul style="list-style-type: none">○ <i>less new generation capacity being brought online to fill the current supply deficit,</i>○ <i>higher electricity tariffs from new renewable energy projects which are forced to be located in regions</i>

<p><i>with less favourable resources,</i></p> <ul style="list-style-type: none"> ○ <i>reduced economic activity in the communities which are in dire need of economic support.</i> <p><i>The project is necessary to connect more renewable energy generation projects to the National grid in line with the IRP2019.</i></p>
<p>Do location factors favour this land use (associated with the development proposal) at this place? (This relates to the contextualisation of the proposed land use on the proposed site within its broader context.)</p>
<p><i>The proposed electrical infrastructure development is perfectly situated because</i></p> <ul style="list-style-type: none"> ● <i>It is within / directly adjacent to authorised solar PV farms and existing electrical infrastructure of the same format</i> ● <i>The entire project area falls within a Strategic Transmission Corridor</i> ● <i>The site is situated in the Solar Corridor as demarcated by the Pixley Ka Seme municipality</i>
<p>Will the development proposal or the land use associated with the development proposal applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?</p>
<p><i>The development proposal (or the land use associated with the development proposal applied for) will not significantly impact on sensitive natural and cultural areas. The development proposal was assessed by the following specialists:</i></p> <ul style="list-style-type: none"> ● <i>Terrestrial Biodiversity Specialist</i> ● <i>Aquatic specialist</i> ● <i>Ornithologist</i> ● <i>Heritage consultant</i> ● <i>Palaeontologist</i> ● <i>Social Impact Specialist</i> <p><i>It was concluded that all impacts can be mitigated to acceptable levels and that the project could go ahead on condition that the Environmental Management Programme (EMPr) (attached as Appendix G) should be implemented at all times.</i></p>
<p>Will the development impact on people's health and well-being (e.g., in terms of noise, odours, visual character and 'sense of place', etc.)?</p>
<p><i>Dust and noise will be created during the construction phase but mitigation measures are in place to minimise these temporary impacts. The development is situated on rural farm land which lowers the significance of impact associated with noise and dust.</i></p> <p><i>There are a number of existing power lines in the area associated with numerous solar plant facilities. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low.</i></p>
<p>Is the development the best practicable environmental option for this land/site?</p>
<p><i>The, 'environment' should be seen as the sum total of one's surroundings, which include the natural, social and economic environments. Taking all constraints into account, the development as proposed underlines the principles as advocated by the term 'triple bottom line' (people, planet, profit) and this development proposal is in support of the goals of economic, social and ecological integration and sustainability.</i></p>
<p>What will the benefits be to society in general and to the local communities?</p>
<p><i>The proposed development will contribute to, amongst others, energy security and blackout relief, benefiting the entire South Africa. Temporary and permanent employment opportunities will be created not only for this project but for the associated renewable energy projects that would be able to connect in the area as a result of this project where the work force will as far as possible be sourced from the local communities.</i></p>

Will the benefits of the proposed land use/development outweigh the negative impacts of it?
<i>Negative impacts associated with the proposed development could be mitigated to levels that will be acceptable within the receiving environment. The positive impact of energy security, blackout relief, increase capacity, reduction in the need to use diesel and other fossil fuels for peaking and baseload power far outweighs the negative impact that this project could have.</i>
Describe how the general objectives of Integrated Environmental Management as set out in Section 23 of the NEMA have been taken into account:
<p><i>Current procedures and/or organisational structures are not necessarily achieving integrated decision-making and/or co-operative governance and, as a result, there is a failure to properly achieve the objectives of IEM as set out in Section 23 of NEMA. EIA's however often focus on the immediate harm a project will cause rather than any benefits it might create in the long term to sustainable development.</i></p> <p><i>The stated objectives of Section 23 are to ensure integrated decision-making and co-operative governance so that NEMA's principles and the general objectives for integrated environmental management of activities can be achieved. The goals are to</i></p> <ol style="list-style-type: none"> <i>a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;</i> <i>b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;</i> <i>c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;</i> <i>d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;</i> <i>e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and</i> <i>f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.</i> <p><i>For this project the following actions were taken to reach the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA:</i></p> <ol style="list-style-type: none"> <i>a) Applicable environmental, economic and social aspects have been assessed, thereby ensuring an integrated approach in order to balance the needs of all whom would be affected by this development.</i> <i>b) Mitigation measures have been supplied in the EMPr in order to ensure that all identified impacts are mitigated to acceptable levels.</i> <i>c) The EA application has to be evaluated and approved by DFFE and no construction may commence prior to the issuing of the Environmental Authorisation.</i> <i>d) The procedures which are followed during the public participation programme are based on the NEMA EIA Regulations 2014, as amended.</i> <i>e) DFFE will take all information as represented in this report into consideration and may request further information should they feel that further studies/information is required before an informed decision can be made.</i> <i>f) The project team (inclusive of the specialists) is confident that the mitigation measures as supplied in the EMPr are reasonable and will be the best way to manage anticipated impacts.</i>
Describe how the principles of environmental management as set out in Section 2 of the NEMA have been taken into account

Chapter 2 of NEMA provides a number of principles that decision-makers have to consider when making decisions that may affect the environment, therefore, when a Competent Authority considers granting or refusing environmental authorisation based on an Environmental Impact Assessment, these principles must be taken into account.

The NEMA principles with which this application conforms are described as follows —

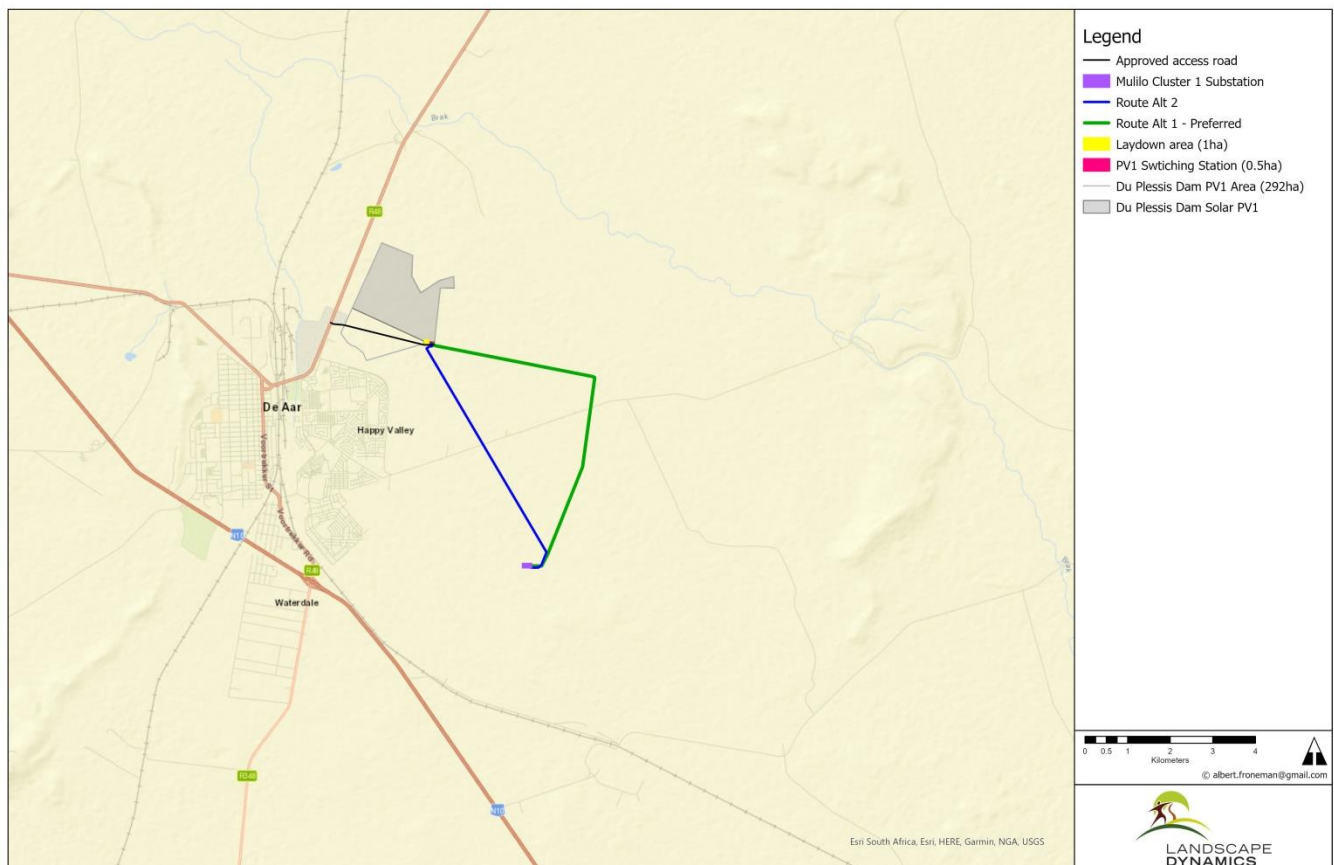
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- Development must be socially, environmentally and economically sustainable.
- Sustainable development requires the consideration of all relevant factors.

The social, economic and environmental impacts of activities, including disadvantages and benefits, were considered, assessed and evaluated, and informed decision-making by the authority is hereby made possible.

2.2 Locality and Regional Context

The proposed project is situated between 3km and 6km east of De Aar, within the jurisdiction of the Emthanjeni Local Municipality, Pixley Ka Seme District in the Northern Cape Province.

Du Plessis Dam Solar PV 1 Grid Connection - Locality map



2.3 Property Information

The proposed infrastructure and preferred route alternative affect the following properties :-

- The Remainder of the Farm Du Plessis Dam No 179
- Portions 1 of the Farm De Aar 180
- Portions 4 of the Farm De Aar 180

Major region				Minor region				Farm / Erf number									Portion number				
C	0	5	7	0	0	0	0	0	0	0	0	0	0	1	7	9	0	0	0	0	0
C	0	5	7	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	1
C	0	5	7	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	4

2.4 Project Description

Purpose of the project

The energy generated by the Du Plessis Dam Solar PV1 needs to be evacuated and connected to the national grid. The only way of achieving this is by means of a switching station and a power line. The proposed electrical infrastructure will connect the electricity generated by the Du Plessis Solar PV1 to the Mulilo Cluster 1 Substation to ultimately connect to the Eskom national grid.

Project components

Refer to Appendix D(1) for a typical layout and specifications of a switching station and pylons.

Infrastructure	Specifications
Powerline (Grid connection)	<ul style="list-style-type: none"> • 132kV S/C Overhead Power line will connect the Du Plessis Dam Solar PV1 Eskom Switching Station with the Mulilo Cluster 1 Substation • Length/Route is approximately 7.6km • Eskom Servitude width is 31m. • A 300m wide corridor was assessed • Associated infrastructure at the Overhead Power Line Route/Servitude <ul style="list-style-type: none"> ○ Steel monopole structures ○ ACSR & OPGW Conductors ○ Foundations and Earthing ○ Line Hardware and Accessories
Access Roads	<ul style="list-style-type: none"> • ±2km, 12m wide access road <ul style="list-style-type: none"> ○ Starting point at the R48 and ends at the PV1 switching station ○ This access road is existing but will be widened to 12m ○ Road was authorised with the Du Plessis Solar PV1 application (DFFE Ref Nr 12/12/16/3/3/2/456) • ±6m wide access road will be constructed along the line route for construction and maintenance purposes – this road will be inside the powerline servitude
Switching Station	<ul style="list-style-type: none"> • 33/132kV switching yard • ± 0.5 hectares in size (50m x 100m) • Internal access roads of 6m wide <p>Associated infrastructure at the Switching Station</p> <ul style="list-style-type: none"> ○ Outdoor Mechanical-Electrical High Voltage Equipment ○ Indoor Medium Voltage Switchgear and Low Voltage Controlgear

	<ul style="list-style-type: none"> ○ Lighting Protection Equipment ○ Perimeter and internal Fencing ○ Buildings required for operation (i.e. ablutions required for maintenance staff)
Laydown area	<ul style="list-style-type: none"> ● A construction site area of ±1 hectares directly adjacent to the PV1 Switching Station is required. ● All temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.
Storage of diesel	<p>Diesel storage of less than 80m³ for the 132kV Switching Station:</p> <ul style="list-style-type: none"> ○ During construction, diesel is required for construction vehicles as well as generators for the construction camp and commissioning whilst waiting for the Eskom grid connection works to be completed ○ During operations, diesel is required for Operations & Maintenance vehicles at the PV plants but also required for backup diesel generators at the substations. The Generators supply auxiliary power to the substation's protection and communications systems, should there be outages on the grid. This is an Eskom requirement together with a battery room at the substations to act as UPS for these critical systems.
Temporary Services	<p>During the construction phase, temporary sanitation facilities will be provided (i.e. chemical toilets) and these toilets will be regularly serviced by a licensed company.</p>

CHAPTER 3: ALTERNATIVES

3.1 Key Considerations in Alternative Assessment

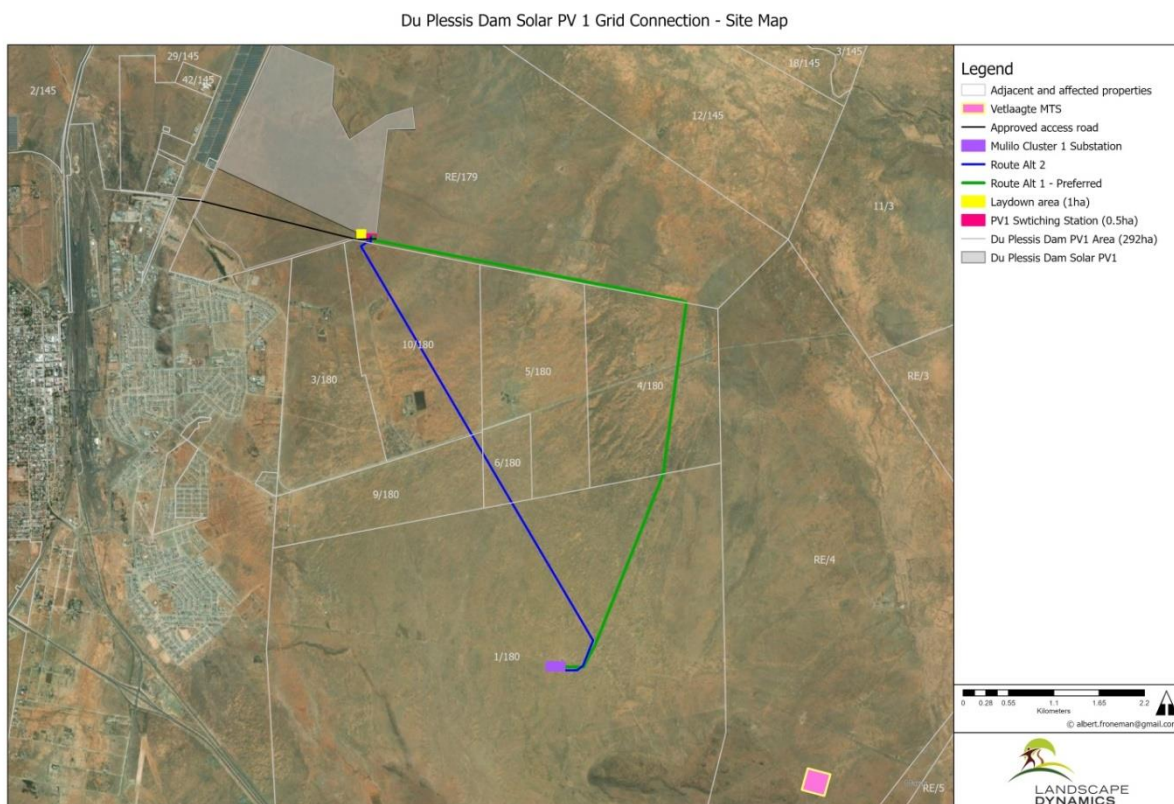
The NEMA EIA Regulations define *alternatives* as follows:

Alternatives, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the—

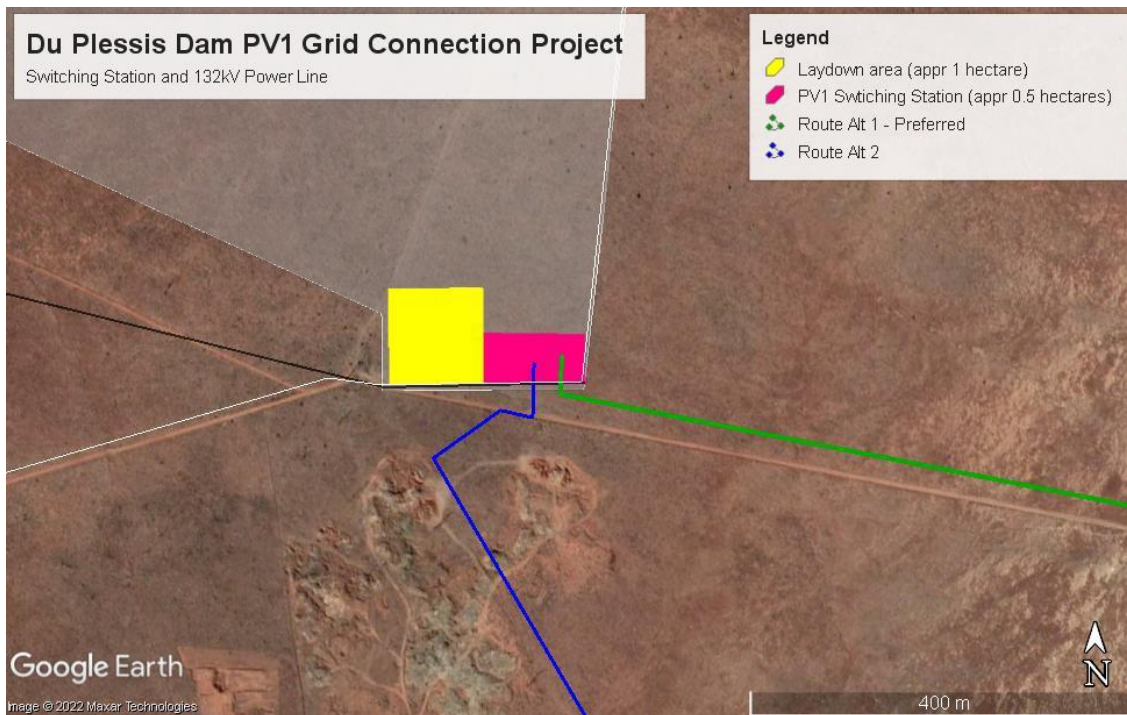
- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity; or
- operational aspects of the activity;

and includes the option of not implementing the activity;

Two alternative powerline route corridors had been considered for the purpose this project, indicated in the map below. Alternative 1 is the green line and alternative 2 the blue line



No alternatives in terms of the position of the switching station and laydown area had been proposed. These two sites fall within the approved Du Plessis Dam Solar PV1.



The following aspects regarding alternatives are applicable to this Du Plessis Dam Solar PV1 Grid Connection and had been considered as follows:

- *Location*

The location of the grid connection (and laydown area) is embedded in the grand design of the authorised solar Du Plessis Dam Solar PV1, which holds Environmental Authorisation valid until 28 September 2025. Changing the location of the switching station site at this stage would thus mean that the layout of the solar PV facility will have to be amended as well, which is not an option to consider due to unnecessary significant time and cost implications. Also, the preferred route runs along existing property boundaries and approved corridors which will necessary result in less impact on the environment. **The preferred route has been identified by Eskom as being their preferred option due to their future planning in the macro area.** Note that the Environmental Authorisation will eventually be transferred to Eskom. There is no justification and/or restrictions from both a technical and environmental point of view to change the position of the switching station site and/or preferred powerline route.

- *Type of activity to be undertaken*

The energy generated by the Du Plessis Dam Solar PV1 needs to be evacuated and connected to the national grid. The only way of achieving this is by means of a switching station and a power line and no other type of activity could meet the purpose of this project.

- *Design, technology and operational aspects*

The design, technology and operational aspects of switching stations/substations and power lines are guided strictly by Eskom standards, stipulations and requirements and it is not within the ambit of the Applicant to change Eskom standards.

- *Environmental Considerations*

The switching station site, laydown area and a 300m wide power line route corridor along two route alternatives had been investigated by the specialist team (fauna & flora, aquatic, bird, heritage, palaeontology and social) to ensure that the environment is protected and that the position of the infrastructure doesn't impact on highly sensitive environmental features. All of these specialists confirmed that either of the two route alternatives could be recommended with the implementation of appropriate mitigation measures from their respective fields of interest. No amendments/deviations to any of these two route alternatives had been proposed. Refer to Chapter 4 that includes a summary of the different specialist fields and recommendations in terms of the alternatives as summarised in Paragraph 3.2 below.

- *Public Participation*

Onsite notices were placed on 22 February 2022; a newspaper advertisement was placed on 25 February 2022; and notification letters were distributed to all Interested & Affected Parties (IAPs) on 2 March 2022. No objection has been received to date. The Draft BAR (this document) is now being distributed for public review and input. Comment/objections received will be carefully assessed and addressed. The responses thereto will be included in the Final BAR. It is however not expected that objections will be received due to the numerous solar farm and associated infrastructure projects in the macro area.

- *No Go Alternative*

This is the "do nothing" alternative. Under these circumstances the switching station and associated 132kV power line will not be constructed and there would obviously be no changes to the environment.

This will however imply that the authorised Du Plessis Dam Solar PV1 will not be able to evacuate the electricity generated and all the advantages of additional, clean, renewable electrical supply to the national Eskom grid will not be realised. A lost opportunity to reduce South Africa's very high carbon emissions would represent a huge negative social cost.

Temporary and permanent employment opportunities that would have been created by the construction of the solar PV farms and electrical infrastructure will be forgone, another negative social cost that can be ill-afforded by South Africa which has a current unemployment rate of 34,9% as calculated in the third quarter of 2021.

Commencement of the Du Plessis Dam Solar PV1 may not commence in the absence of approval of

this grid infrastructure.

It is concluded that the No-Go option is not a viable alternative and will not be assessed further during this Basic Assessment process.

3.2 Conclusion of Alternatives

Both the proposed and preferred corridor for the Du Plessis Dam Solar PV1 Grid Connection (inclusive of the 132kV powerline, the switching station and the laydown area) will have a minimal negative impact on the environment with the implementation of proposed mitigation measures.

Comparison of route alternatives (to be read with the specialist reports summarised in Chapter 4)

Component	Route Alternative 1	Route Alternative 2
Technical Preference	Preferred	Acceptable
Terrestrial Ecological Impact	Alternative 1 is preferred	Acceptable
Avifauna impact	Alternative 1 is preferred	Acceptable
Aquatic environment	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Heritage Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Palaeontological Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Social Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference

The eastern (preferred) alternative powerline corridor is preferred from a technical point of view (as confirmed during discussions between Eskom and the Applicant as well as from an avifauna and terrestrial ecological viewpoint). There are no environmental constraints associated with the preferred powerline route. The assessment of any further alternative sites or routes is therefore not justifiable from a technical and/or environmental point of view.

The EAPs are confident that the infrastructure and preferred powerline corridor as presented is acceptable and viable.

CHAPTER 4: RECEIVING ENVIRONMENT & SPECIALIST STUDIES

4.1 General Description of the Study Area

General

The proposed Du Plessis Dam Solar PV1 Grid Connection lies between 3km and 6km east of the town of De Aar, in the Northern Cape Province. De Aar is surrounded by agricultural areas that are mostly used for livestock grazing. The macro area includes a number of operational and proposed renewable energy projects. Most of the site consists of natural vegetation. The exception is a gravel road crossing the alignment corridor approximately at its central point, and there is some historical disturbance in the northern part of the corridor area.

Topography

The majority of the landscape consists of flat to slightly undulating plains with shallow valleys that are drained by tributaries of the Brak River, a northward-flowing tributary of the Lower Orange River. Occasional low hills occur in the wider study area. The elevation on site varies from 1240m to 1336m above sea level.

Agriculture

Grazing of both sheep and game is the dominant agricultural land use in the area. Grazing capacity of the site is fairly low at 20 hectares per large stock unit. There is no cultivation in or near the project site and the surrounding area is confined to small, isolated patches of pasture or fodder crops around farmsteads.

Climate, Hydrology and Geohydrology

At De Aar, the summers are hot; the winters are short, cold, and windy; and it is dry and mostly clear year-round. Average temperatures vary from 16°C in June/July to 32°C in January and February. The wet season occurs from mid-November to mid-April with February, tending to be the wettest month and July the driest month. The mean annual rainfall for the area is 282 mm.

Due to the climatic conditions of the area, the smaller watercourses and the wetland areas that occur in the area are ephemeral (non-perennial), only containing water for short periods, immediately following local rainfall events. A dominant feature of the larger rivers is the alluvial floodplains that are characterised by multiple channels that are interchangeably used during higher flow events. These sandy floodplains tend to have mostly bare beds, with vegetation occurring in clumps along the bed and more densely along the banks. The ephemeral watercourses are highly dependent on groundwater discharge.

Also as a result of the low rainfall, the area has been mapped as a Strategic Water Source Area for groundwater (De Aar Region). A major fractured aquifer occurs within the area. The water table typically occurring at depths of about 8m below ground level and the yield of the aquifer is less than 2 litres a second. Both the surface and groundwater quality tend to be slightly brackish with natural electrical conductivity concentrations of between 70 and 150 mS/m. The estimated groundwater recharge in the area is 12.3 mm/a. The aquifer is of medium susceptibility and vulnerability.

Geology and Soils

The geology of the study area can be described as being underlain by flat-lying sedimentary rocks of the

Karoo Supergroup, which have been intruded by innumerable sills and dykes of dolerite. The overlying soils are variable from shallow to deep, red-yellow apedal, freely draining soils to very shallow Glenrosa and Mispah forms. The soils in the study site are primarily red soils of a restricted soil depth, excessive drainage, high erodibility and low fertility. Calcrete soils are also prevalent as a result of the climatic conditions and underlying parent material.

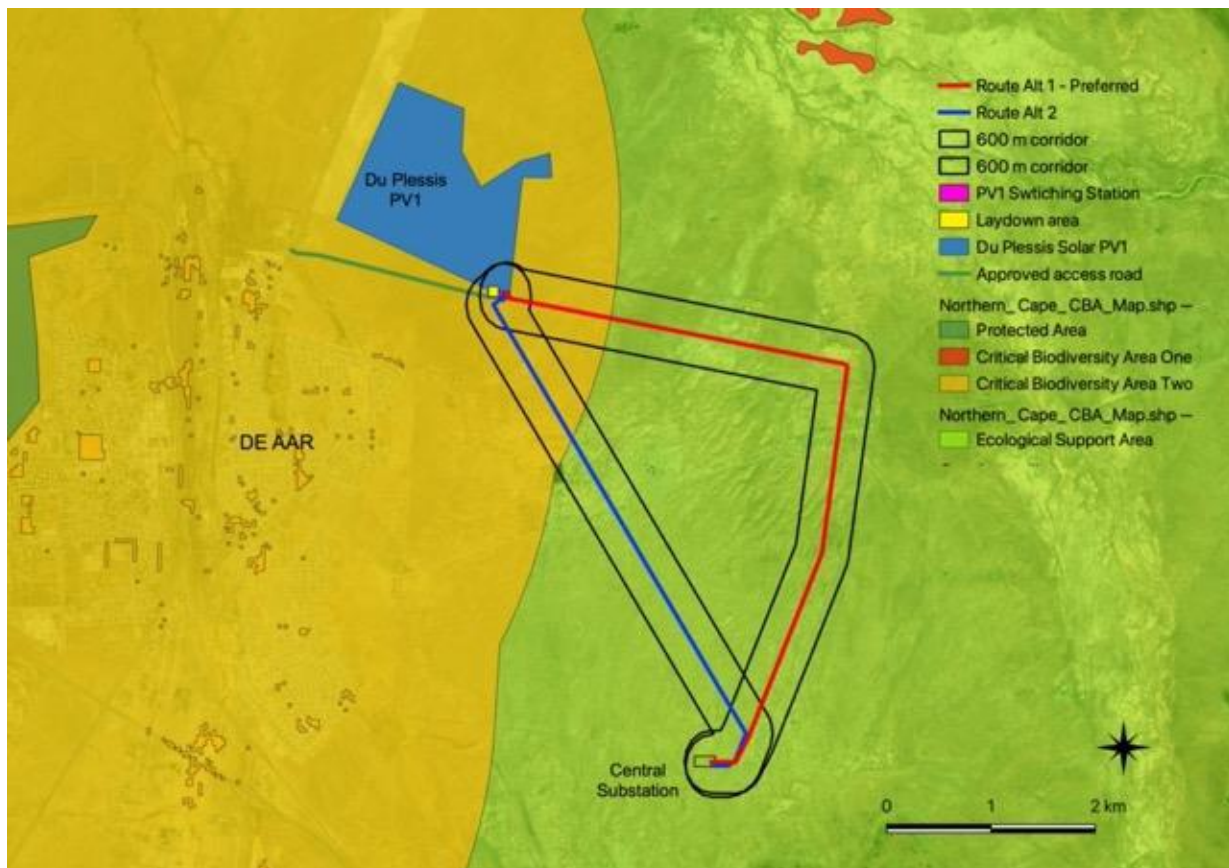
4.2 Biophysical Environment

4.2.1 Terrestrial Ecological Specialist Assessment

A Terrestrial Ecological Specialist Assessment was undertaken by Dr David Hoare from David Hoare Consulting (Pty) Ltd and is attached as Appendix E(1). A summary thereof follows below.

4.2.1.1 Flora

The corridors are both partially within a Critical Biodiversity Area 2 and partially within an Ecological Support Area (ESA), the latter of which extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project, and the CBA² area is the location of the associated solar PV project, which has already been authorised.



There is one regional vegetation type in the study area, namely Northern Upper Karoo. The conservation status of this vegetation type is 'Least Threatened'.

Typical view of the habitat that occurs in the study area



No plant species of concern were found on site. One rare plant species, *Tridentea virescens*, could potentially occur in the general area but was not seen. It occurs across a very wide geographical area and loss of a small area of habitat will not affect the species.

There is one protect tree species that has a geographical distribution that includes the study area, *Boscia albitrunca* (Shepherd's Tree / Witgatboom / !Xhi). No individuals were found on site and none are likely to occur there.

4.2.1.2 Fauna

There are three small locations on site in which it appears that there may have been some historical removal of material and/or irrigation pipe leakage where seasonal to permanent water collection now occurs. Within these depressions in the northern part of the site, rain water is able to collect and, at the time of the field survey, was ideal habitat for a large number of frogs, including the protected amphibian, the Giant Bullfrog, *Pyxicephalus adspersus*. On this basis, these areas are treated here as having higher sensitivity than the surrounding plains, even though they are artificially-created habitats, and are classified as having MEDIUM-HIGH sensitivity. In an arid environment, any location with water will attract life disproportionately to surrounding areas.

The observation of the giant bullfrog habitat was within the Alternative 2 corridor where it is likely to be resident. Loss of a small area of habitat for the proposed projects will not adversely affect the species, but it would be preferable to avoid impacts, if possible. From this perspective, Alternative 1 (preferred) is therefore marginally preferred here.

Artificial depressions occur along the second route alternative – to be avoided

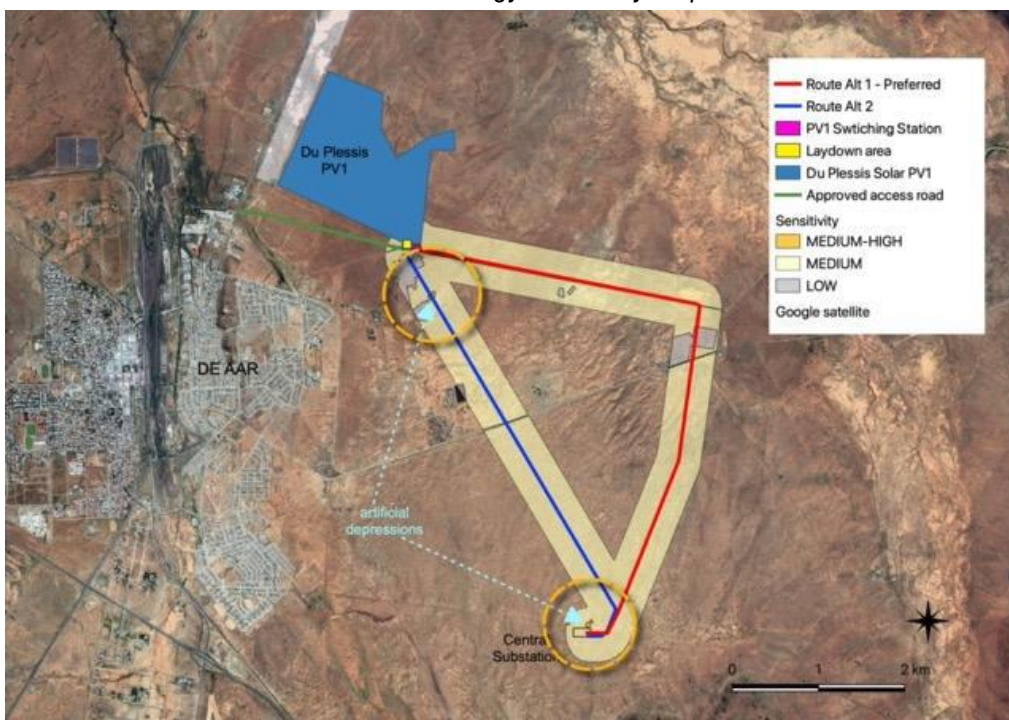


Conclusion of the Terrestrial Ecological Specialist Assessment

Both alternatives cross similar plains habitat that have medium sensitivity. From this perspective, either option is therefore acceptable. Alternative 1 (preferred) is slightly longer, but Alternative 2 crosses an area where Giant Bullfrog was found. The species is likely to be more widespread than just the locality it was observed, but the confirmed location should be avoided, if possible. The entire northern section of Alternative 1 (preferred) is along a fenceline that has an existing road / fire-break. This is an existing disturbance that can be utilized as an access road.

Impacts of the proposed project components are relatively insignificant in comparison to the variety of approved solar PV projects within the immediate surroundings.

Terrestrial Ecology Sensitivity Map



Possible impacts associated with the project are the following (refer to Chapter 6 for the impact assessment):-

- Loss of natural habitat.
- Loss of individuals of protected trees, protected plants or other listed species (no specific concerns seen on site).
- Loss of faunal habitat.
- Invasion by alien invasive plant species as a result of disturbance.

The following main recommendations were made to protect and enhance sensitive ecological features on site, which occur outside the proposed footprint areas:

- The small depressions within the Alternative 2 corridor on site should be treated as moderately sensitive. Measures should be implemented to protect these areas from direct impacts.
- Alien invasive species must be strictly managed.

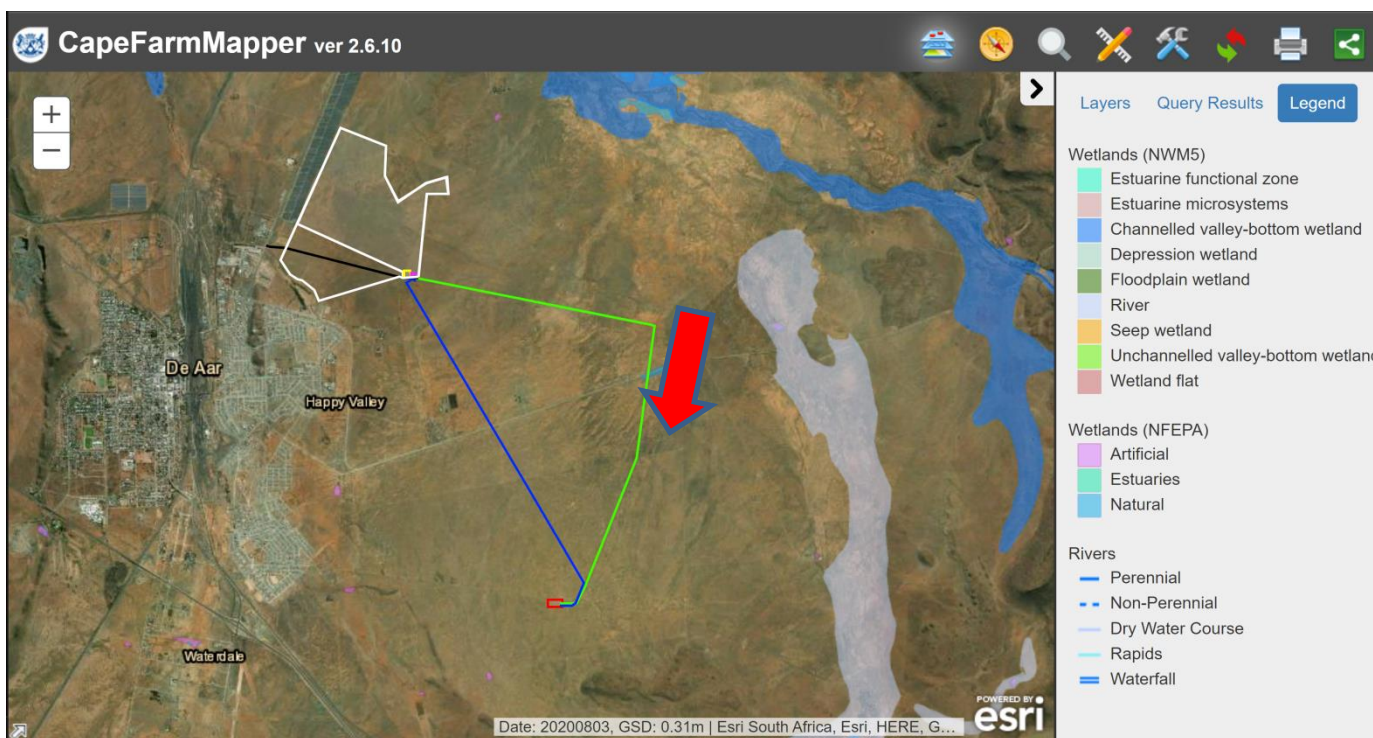
4.2.2 Aquatic Specialist Impact Assessment

An *Aquatic Specialist Impact Assessment* was undertaken by Dr Toni Belcher of BlueScience (Pty) Ltd, and is attached as Appendix E(2). A summary thereof follows below.

The site is not in a Strategic Water Source Area for surface water. Due to the climatic conditions of the area, the smaller watercourses and the wetland areas that occur in the area are ephemeral (non-perennial), only containing water for short periods, immediately following local rainfall events. A dominant feature of the larger rivers is the alluvial floodplains that are characterised by multiple channels that are interchangeably used during higher flow events. These sandy floodplains tend to have mostly bare beds, with vegetation occurring in clumps along the bed and more densely along the banks. The ephemeral watercourses are highly dependent on groundwater discharge.

The aquatic features within the wider study area comprise ephemeral unnamed tributaries of the Brak River. The Brak River is a seasonal tributary within the Lower Orange River System. The river flows approximately 3 km to the north of the study area with a larger tributary crossing the eastern extent of the farm, flowing in a northerly direction to join the Brak River. Associated with these larger watercourses are wider floodplains and some depression wetlands. Several smaller watercourses and drainage lines drain into these larger river corridors. The ephemeral streams and floodplains provide aquatic habitat to a diverse array of faunal species that are adapted to the brief periods of inundation to carry out much of their life phases.

The catchments of the tributaries of the Brak River near the Du Plessis Dam PV1 Grid Connection Project are mapped as Upstream Management Areas (Figure 3) that are sub-catchments in which human activities need to be managed to prevent the degradation of downstream Freshwater Ecosystem Priority Areas (FEPAs) and Fish Support Areas. There is only one FEPA Wetland mapped along the proposed grid connection route (Figure 4). **This wetland was determined during the field assessment as an off-channel farm dam/reservoir that is not considered of any aquatic biodiversity conservation significance.** Some wetland habitat has also been mapped further to the east of the proposed route that is associated with the Brak River Tributary. The wetlands are located some distance from the proposed activities and are unlikely to be impacted by the proposed project.



NFEPA Wetland and National Wetland Map 5 mapping for the proposed project and surrounding area (Cape Farm Mapper, May 2022) - the artificial dam referred in the following paragraph is indicated with a red arrow.

Conclusion of the Aquatic Specialist Impact Assessment

The proposed grid connection and switching station for PV1 are located outside of the wider floodplain area of a Brak River Tributary that lies to the north-east and east of the project activities. Some minor watercourses of low ecological sensitivity occur near the route that is of low sensitivity and have poorly defined channels and little associated aquatic habitat and biota. The proposed activities are thus unlikely to have any impact on these aquatic features.

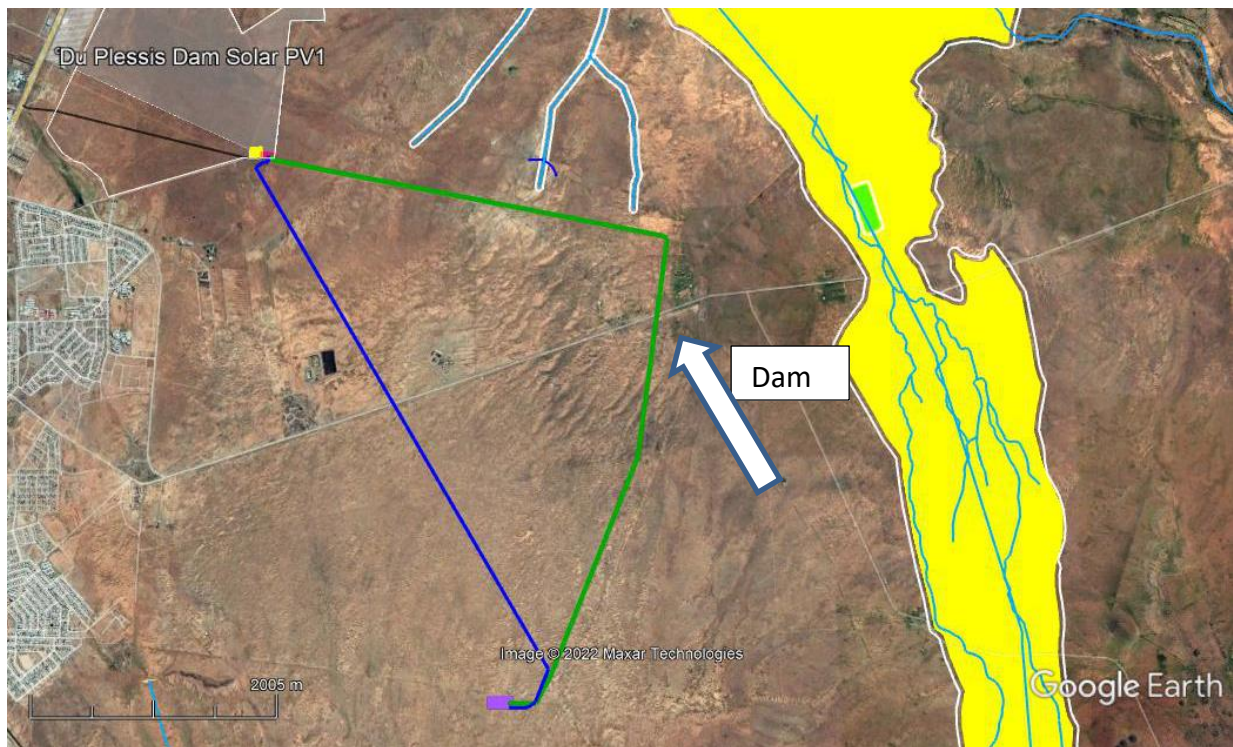
A small dam has been constructed along the eastern side of the proposed PV1 grid connection route corridor that is mapped as a FEPA wetland and has some associated artificial wetland habitat. Considering that the wetland habitat is artificial, associated with a constructed dam and along a gravel farm access road, as well as the fact that the proposed powerline can easily span the feature, no aquatic ecosystem are any significance are likely to be associated with the proposed activity at the dam.

The potential aquatic biodiversity impacts of the proposed activities are likely to be negligible in terms of any potential impact to aquatic habitat, biota, water quality, or flow for all phases of the proposed development.

Both route alternatives assessed would have same potential aquatic ecosystem impacts that are of negligible significance.

No Water Use Authorisation should be required for this project.

Aquatic Sensitivity Map – indicating no environmentally sensitive aquatic features occur within both route alternatives



4.2.3 Avifauna Specialist Impact Assessment

An Avifauna Specialist Impact Assessment was undertaken by Dr Owen Davies and Ms Ashlin Bodasing of Arcus Consultancy Services South Africa (Pty) Ltd, and is attached as Appendix E(3). A summary thereof follows below.

The entire project site falls within the large Platberg-Karoo Conservancy (SA037). The conservancy covers the entire districts of De Aar, Philipstown and Hanover in the southeastern portion of the Northern Cape Province. Although the land in the IBA is primarily used for grazing and agriculture, it includes the suburban towns of De Aar, Philipstown, Petrusville and Hanover.

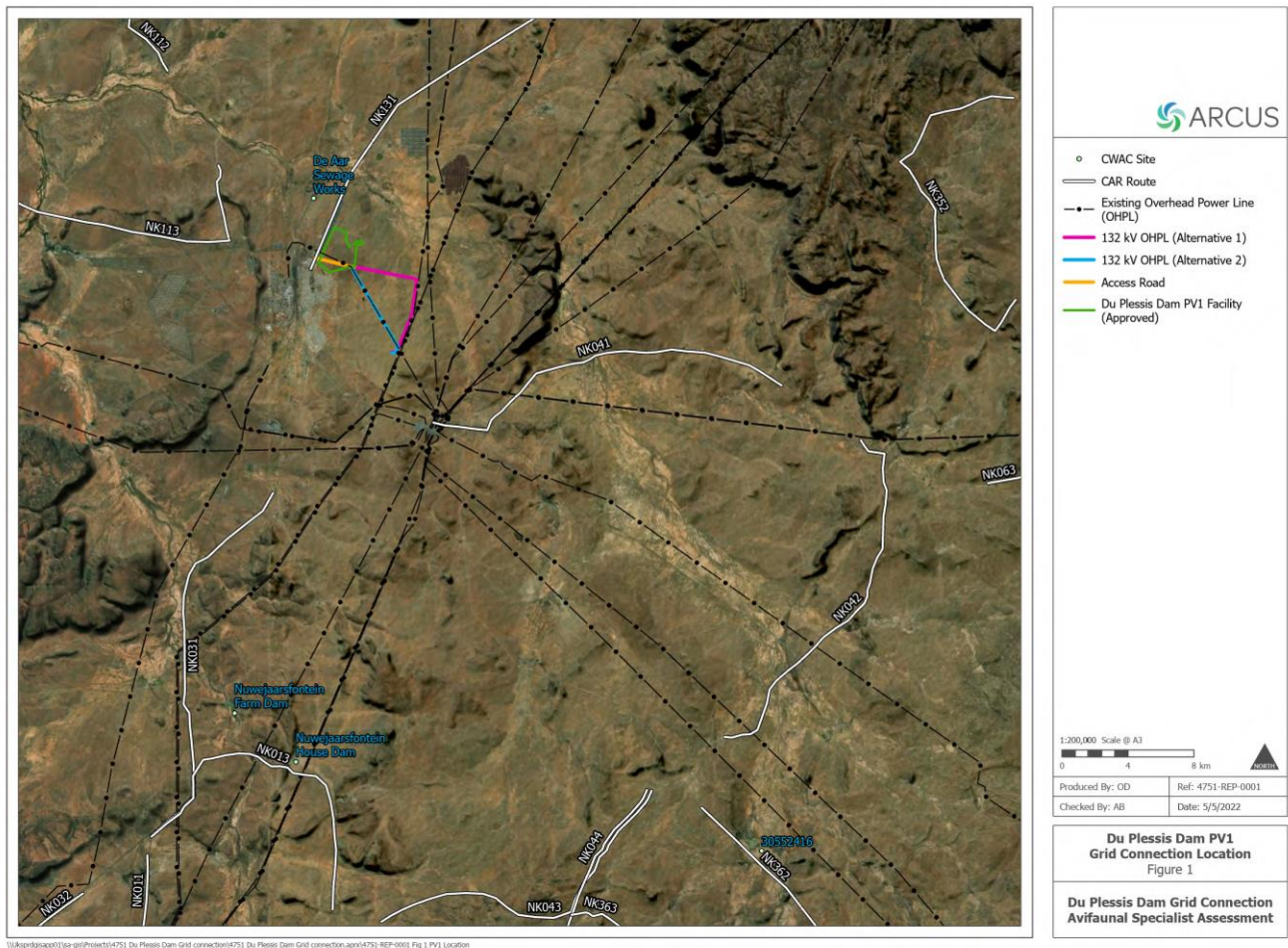
The desktop study and site visits resulted in the following list of focal avifaunal species: The regionally Endangered Ludwig's Bustard, Martial Eagle, Tawny Eagle; the Vulnerable Verreaux's Eagle, Lanner Falcon, Black Stork, Secretarybird (globally Endangered), Burchell's Courser as well as Near-Threatened species such as Blue Crane (globally Vulnerable), Kori Bustard, Karoo Korhaan, Greater Flamingo and African Rock Pipit. Although this impact assessment focuses on Red Data species, the impact on non-Red Data species was also considered.

Several minor and major impacts exist across the proposed development area including cultivated land and grazing/agricultural practices, roads and disturbance from the adjacent town of De Aar. The current impact with the most relevance to avifauna is the presence of multiple existing overhead power lines crossing the area, converging on the nearby Eskom Hydra Main Transmission Substation. The majority of the existing spans of overhead power lines do not have bird flight diverters or similar mitigation measures currently attached to them and the pylons of parallel lines are often adjacent to each other. The gravel roads

surrounding De Aar (e.g. Arend Street) also currently experience traffic from large construction vehicles associated with the nearby quarry, local stone crushers and brickworks.

The main impacts as they relate to avifauna associated with the proposed development are therefore already present on the proposed development site. The proposed development may offer an opportunity to reduce the cumulative impacts to avifauna instead of increasing them through the implementation of mitigation measures that operate in concert with the current infrastructure, particularly for large-bodied avifauna through increased visibility of obstacles across the landscape potentially reducing the cumulative risk of collisions.

Numerous existing overhead powerlines in the macro area in relation to the proposed powerline route corridors



The corridor relating to the Du Plessis Dam PV1 Grid Connection and associated infrastructure is of very low avifaunal sensitivity.

Conclusion of the Avifauna Specialist Impact Assessment

The total area of habitat destruction associated with the footprint of the grid connection and associated infrastructure is relatively small compared to the proportion of habitat available in the area, and does not represent a fatal flaw that would prevent the proposed development from proceeding. As the majority of the proposed power line corridors assessed run adjacent to existing power lines, which are largely unmarked in

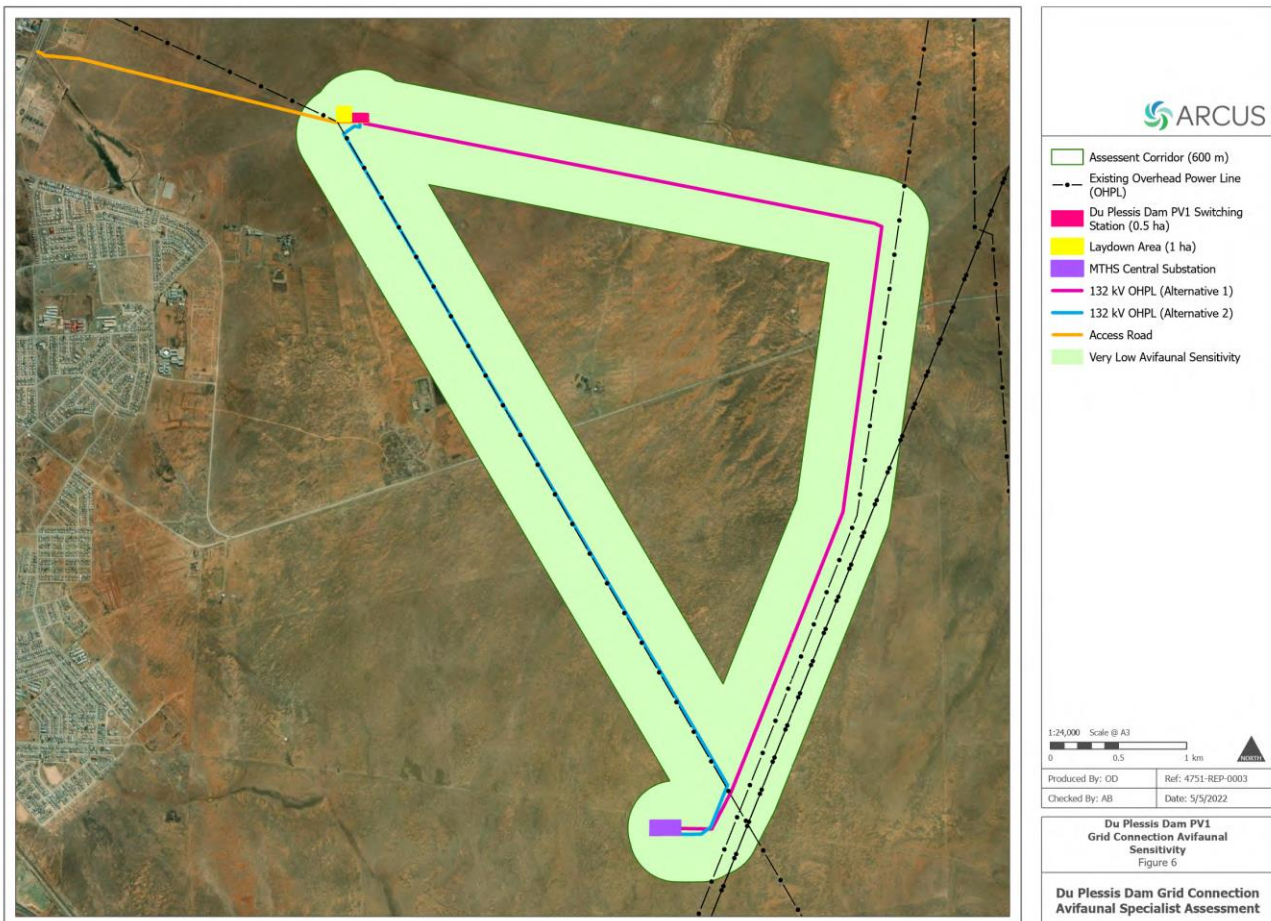
terms of bird flight diverters, the impact significance of collision associated with the proposed power line is unlikely to increase beyond that which already exists and could potentially reduce the overall risk to birds.

The assessment of the grid connection and associated infrastructure proposed for Du Plessis Dam PV1 considers two alternative routes for the overhead power line. Either alternative is acceptable from an avifaunal perspective, however Alternative 1 is preferred as the route follows multiple existing overhead power lines thereby increasing the opportunity (and likely efficacy) of improving the visibility of these obstacles through the addition of the proposed overhead power line and recommended mitigation measures.

The proposed project is unlikely to impose significant impacts on the avifauna of the receiving environment. No significant negative impacts have been identified and therefore the project can be authorised from an avifaunal perspective.

General impact associated with avifauna and overhead powerlines are related to habitat destruction, disturbance or displacement by noise and activity; as well as mortalities due to collisions, entrapment and/or electrocutions.

Avifaunal sensitivity map: indicating both route alternatives as having a very low avifaunal sensitivity



\\kspg\apps\1\sa-gis\projects\4751 Du Plessis Dam Grid connection\4751 Du Plessis Dam Grid connection.aprx\4751-REP-0003 Fig 6 Pv1 Sensitivity

4.3 Cultural-Heritage Environment

4.3.1 Heritage Impact Assessment

A Heritage (including Archaeology) Impact Assessment was undertaken by Dr Jason Orton, of Asha Consulting and is attached under Appendix C. The key findings are summarised as follows:

No graves were observed during the survey.

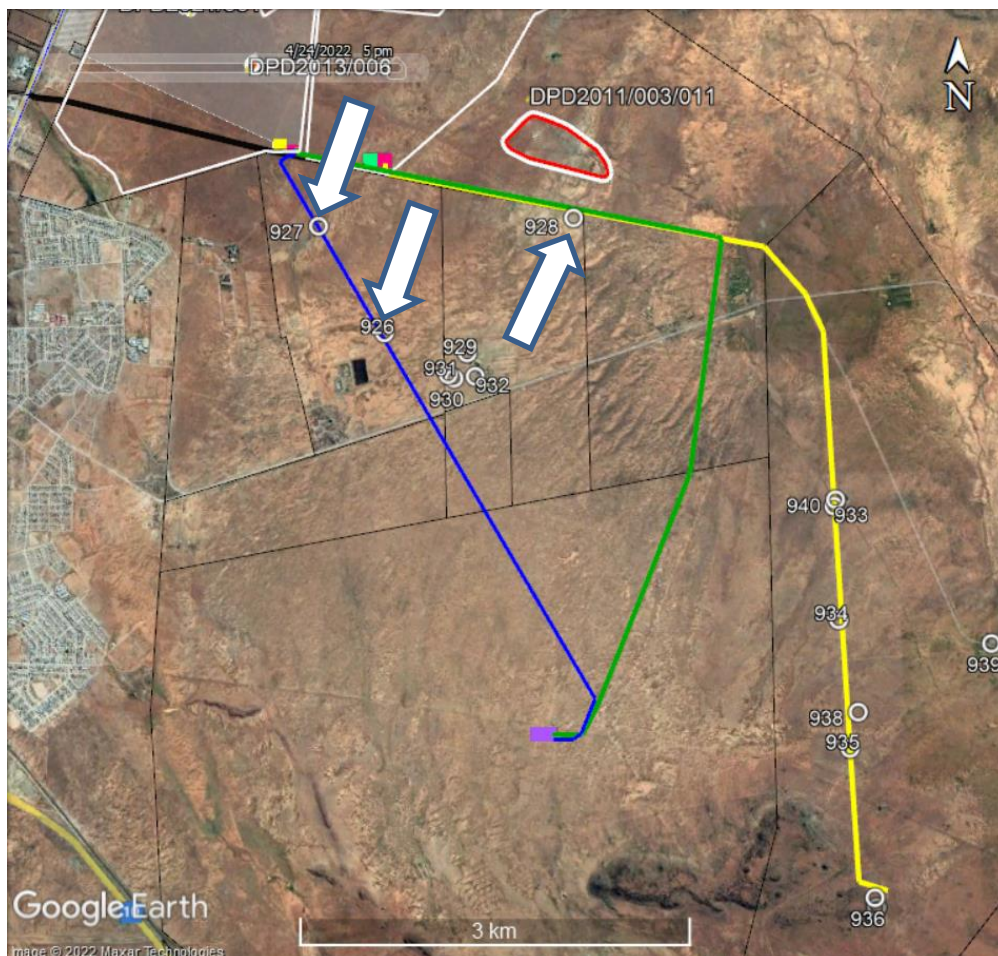
Three sites of mixed age scatters of hornfels flaked artefacts were identified – one along the preferred corridor and two along the 2nd corridor alternative. They are however of very low significance and do not require any mitigation.

The landscape was found to be heavily dominated by existing electrical infrastructure which forms a new layer on the landscape. The new developments will thus be in keeping with this land use and will not introduce any new or significant impacts.

Conclusion of the Heritage Impact Assessment

Given that there are no significant impacts to heritage, the provision of more electricity in South Africa is deemed to be a socio-economic benefit that outweighs the impacts to heritage.

Archaeological Sensitivity Map – indicating the three sites of mixed age scatters of hornfels flaked artefacts which have very low significance and do not required mitigation



It is recommended that the proposed powerline and switching station be authorised (using either alternative), but subject to the following recommendations which should be included as conditions of authorisation:

- Surface clearance is to be kept to the minimum required for the project; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

4.3.2 Palaeontology

Based on the geology of the area and the palaeontological record, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through in April 2022 confirmed that there are only a few scattered fragments of transported silicified fossil wood. The sands of the Quaternary period would not preserve fossils. It is not known if there are fossils below the ground surface.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Conclusion of the Palaeontological Impact Assessment

Based on the above information it is recommended that no further palaeontological impact assessment is required. However, should fossils be discovered by the contractor, developer, environmental officer or other designated responsible person once excavations for foundations have commenced, a palaeontologist should be called to assess and collect a representative sample. A Fossil Chance Find Protocol should then be followed.

Since the impact will be low, as far as the palaeontology is concerned, the project could be authorised.

4.4 Social Environment

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

The key positive social impact associated with the project is the creation of employment and business opportunities, as well as the opportunity for skills development and on-site training.

The main negative impacts associated with the projects are the impacts associated with the presence of construction workers on local communities causing a safety risk, stock theft and damage to farm infrastructure; as well as noise, dust, and safety impacts of construction related activities and vehicles.

There are a number of existing power lines in the area associated with the Hydra substation and SEFs in the area. The potential for cumulative impacts associated with combined visibility (whether two or more power lines will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more power lines along a single journey, e.g., road or walking trail) does therefore exist. However, the cumulative impact on the areas sense of place is likely to be low.

Conclusion of the Social Impact Assessment

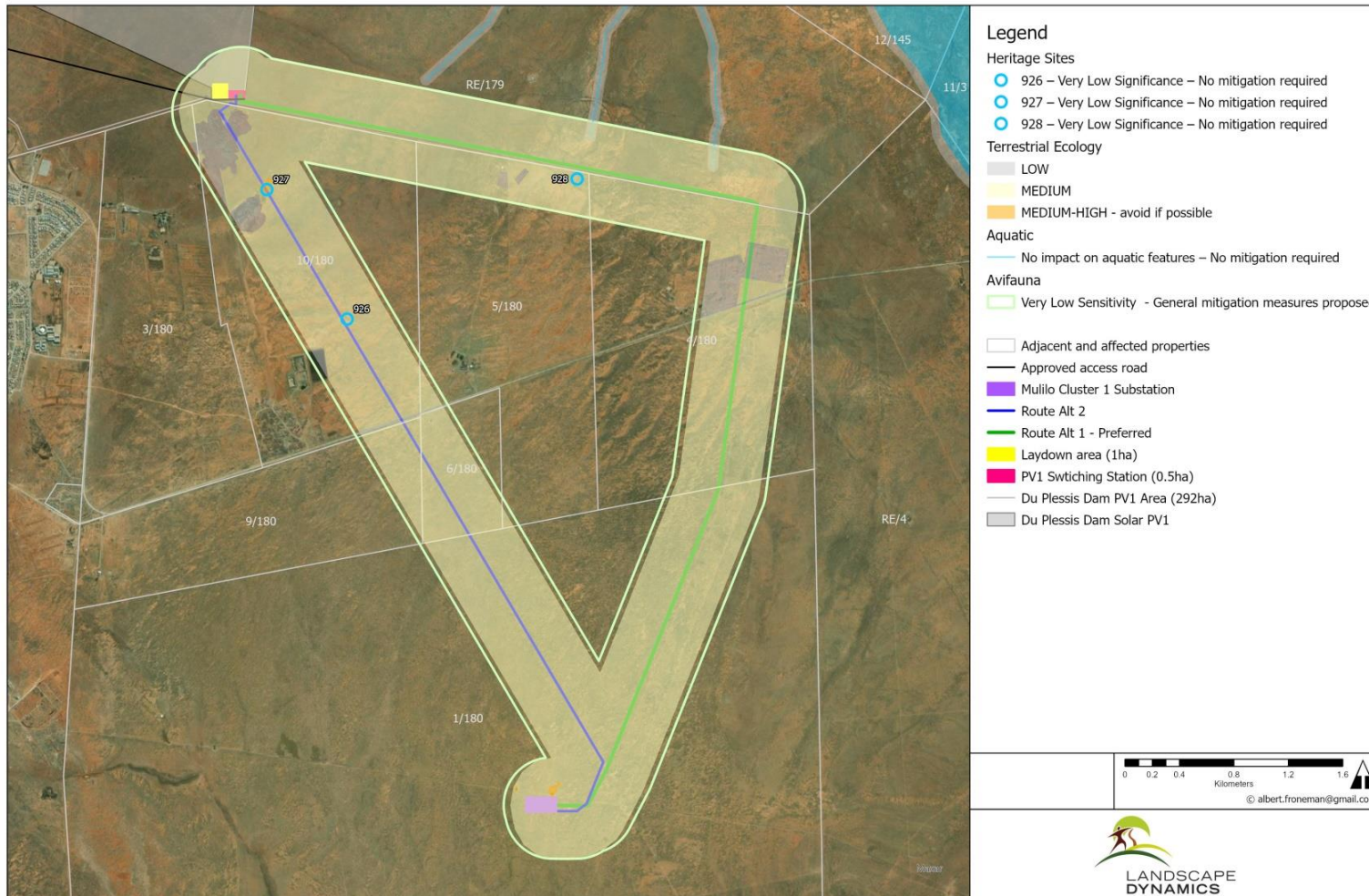
The findings of the study indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Du Plessis Dam Solar PV1 overhead power line is *Low Negative* with mitigation. This applies to both Alternative 1 (Preferred Alternative) and Alternative 2.

The energy security benefits associated with the proposed Du Plessis Dam Solar PV1 are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The establishment of proposed 132 kV grid connection for the Du Plessis Dam PV1 is therefore supported by the findings of the Social Impact Assessment.

4.5 Combined Environmental Sensitivity

From the map below, it is clear that there are no environmental constraints along the preferred powerline route that requires specific consideration in terms of planning. There are no buffer areas and/or 'no go' areas within the preferred route corridor. The 2nd alternative has some terrestrial constraints (bullfrog habitat) that needs to be avoided.

Du Plessis Dam Solar PV1 Grid Connection : Combined Environmental Sensitivity Map



CHAPTER 5: PUBLIC PARTICIPATION

5.1 Objectives of the Public Participation Programme

The main aim of public participation is to ensure transparency throughout the EIA process. The objectives of public participation in this EIA are the following:

- To identify all potentially directly and indirectly affected stakeholders, government departments, municipalities and landowners;
- To communicate the proposed project in an objective manner with the aim to obtain informed input;
- To assist the Interested & Affected Parties (IAPs) with the identification of issues of concern, and providing suggestions for enhanced benefits and alternatives;
- To obtain the local knowledge and experience of IAPs;
- To ensure that all reasonable alternatives are identified for assessment.
- To communicate the proceedings and findings of the specialist studies;
- To ensure that informed comment is possible;
- To ensure that all concerns, comment and objections raised are appropriately and satisfactorily documented and addressed.

5.2 Public Participation Process Followed

The process followed in the Public Participation Process undertaken for this project involves in short the following:

Initial Advertising Process

This part of the PPP process was combined for both the Du Plessis Solar PV1 Grid Connection and the Du Plessis Solar PV2 Grid Connection as per agreement with the Department of Forestry, Fisheries and the Environment (DFFE) on 11 February 2022. Actions involved the following:

- Three laminated A2 onsite notifications had been placed on site on 22 February 2022.
- A newspaper advertisement was placed in Die Echo/Midland Nuus on 25 February 2022
- A comprehensive list of Interested & Affected Parties has been compiled and is being updated throughout the EIA process.
- A Notification Letter had been prepared and was distributed on 2 March 2022 (via email and/or registered post where e-mail addresses were not available) to everyone on the IAP list.

Communication of the Draft Basic Assessment Report

The Draft BAR (this document) was distributed as follows:

- All IAPs indicated on the IAPs Register have received notification via email that the Draft BAR is available for comment (proof thereof will be provided in the Final BAR).
- The Draft BAR is being distributed for a 30-day (plus holidays) commenting period.
- All IAPs have received an email with the Executive Summary and Draft BAR as an attachment. A link to the Draft BAR and all the Appendices is available on the Landscape Dynamics website (www.landscapedynamics.co.za) – detailed instructions on how to access these documents were provided in the said email.

- The Application Form together with the Draft BAR was submitted to DFFE for comment via their online system.

Final Basic Assessment Report

- All communication received on the **Draft BAR** will be included and addressed in the **Final BAR** to be submitted to DFFE for their consideration for Environmental Authorisation.
- Note that the Final BAR will be distributed for a further 30-day commenting period should any substantial changes to the Draft BAR be needed due to public input received. Alternatively, the Final BAR will be submitted to the DFFE for approval/refusal without any further public input should the changes be non-substantial.

Notification of Environmental Authorisation

- All registered stakeholders will be informed of the decision of the DFFE as soon as Environmental Authorisation had been received. All stakeholders will also be notified of the relevant appeal procedure.

Proof of the actions referred to above are included in Appendix D of the Basic Assessment Report and is summarised and addressed under the following headings of the Comments and Responses Report in Appendix F(8):

Communication resulting from the Initial Advertising Period
 Communication resulting from the distribution of the Draft BAR
 Communication on the Final BAR if relevant

To date, no objections from the IAPs were received. Notably no objection was received from directly affected and/or adjacent landowners.

5.3 Communication during the Initial Advertising Period

Stakeholder	Comments with Responses from the EAPs
SA Civil Aviation Authority	SACAA confirmed that the relevant obstacle approval was granted to the respected projects – Du Plessis Dam Solar PV1 and Du Plessis Dam Solar PV2. <i>Response from Landscape Dynamics</i> <i>Noted – no further action will take place.</i>
The Northern Cape Department of Agriculture, Environmental Affairs, Land Reform and Rural Development	She requested to be registered as a stakeholder for the project and also requested to be provided with the biodiversity relates reports and maps to enable informed comment from them. <i>Response from Landscape Dynamics</i> <i>She has been registered as a stakeholder and she will as a registered stakeholder receive the required documents with the Draft Basic Assessment Report.</i>
South African Radio Astronomy Observatory (SARAO)	They confirmed that SARAO has taken a high-level impact assessment, and based on the information provided, it was determined that the projects represent a low risk of interference to the SKA radio telescope with a compliance surplus of 44,48dBm/Hz for the Du Plessis Dam Solar PV1 Grid Connection and

	<p>49,54dBm/Hz for the Du Plessis Dam Solar PV2 Grid Connection. As such, SARAO does not have any objection to the 2x grid connection projects.</p> <p>Response from Landscape Dynamics <i>Noted – no further action will take place.</i></p>
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5.4 Comment received on the Draft Basic Assessment Report

All comment received on the Draft BAR (this document) will be included and addressed in the Final BAR which will be submitted to DFFE for issuing/refusal of the EA.

5.5 Conclusion of the Public Participation Programme

The main objective of the Public Participation Programme undertaken for this project is to identify a viable development site that is not only acceptable from an ecological point of view, but also from a landowner and public perspective.

No objections had been received up to date. It is also not expected that objections will be received due to the numerous solar farms and associated infrastructure projects in the macro area. Powerlines and electrical infrastructure form part of the landscape of De Aar. It is no longer unwanted in the area. This will be confirmed in the Final BAR.

CHAPTER 6: IMPACTS, IMPACT ASSESSMENT AND MITIGATION

6.1 Methods Used to Identify Impacts

Environmental issues and impacts have been identified through the following means:

- Evaluation and consideration of relevant existing environmental data and information;
- Review of the BA/EIA reports of the authorised solar PV farms;
- Information as obtained from the specialists appointed for this project;
- Correspondence with Interested and Affected Parties, including directly affected landowners, general stakeholders and relevant authorities;
- Consultation with the EIA Project Team, supported by the Mulilo Project Team;
- The general knowledge and extensive experience of the Environmental Consultants in the field of Environmental Impact Assessments.

6.2 List of Impacts Associated with the Development

6.2.1 *Expected Negative Impacts*

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion and groundwater contamination
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

6.2.2 Expected Positive Impacts

6.2.3 Cumulative impact

Cumulative impacts of a development may become significant if seen in context with impacts that emanates from other developments within the macro area.

The potential cumulative impacts for this project should be seen together with the potential impacts associated with the approved solar facilities that include Du Plessis Dam Solar PV1 and Du Plessis Dam Solar PV2, existing and approved future grid connections as well as other renewable energy facilities and associated infrastructure in the macro area. Two operational wind energy facilities of 100MW and 140MW respectively and another proposed wind farm occur in the vicinity of the project site. All of these consist of additional electrical infrastructure including facility substations and power lines. The cumulative impact of additional electrical structures that this project may cause is considered to be low/negligible – this was also confirmed during the assessments made by the specialists appointed for this project. It is therefore concluded that the addition of the electrical infrastructure as proposed will have a minimal cumulative impact within the area.

6.3 Generic Eskom Environmental Management Programme (EMPr)

On 22 March 2019 a *Generic Environmental Management Programme* was promulgated in terms of Section 24 of NEMA and gazetted as Government Notice No 435. This EMPr is applicable where application is made for Environmental Authorisation for substations and overhead electricity transmission and distribution infrastructure as identified in terms of

- activity 11 or 47 of EIA Regulations Listing Notice 1 of 2014, as amended, or for
- activity 9 of EIA Regulations Listing Notice 2 of 2014, as amended,
- and any other listed and specified activities necessary for the realisation of such infrastructure.

The EMPr which forms part of the Basic Assessment Report is a legally binding document and contains general as well as site specific mitigation measures / management actions to lessen the impact that this development may have on the environment.

In order to prevent duplication between the Impact Assessment Tables as given below and the mitigation measures / management actions as provided in the EMPr (it is a 131 page document), reference will be made to the generic EMPr where the mentioned impacts are being addressed.

Site specific mitigation measures mentioned below also forms part of Appendix A: Part C as well as Appendix B: Part C of the EMPr.

6.4 Environmental Impact Assessment

The Environmental Impact Assessment Tables include descriptions of expected impacts on the different environmental components as well as proposed mitigation measures / management actions to minimise those impacts to acceptable levels. These mitigation measures are also included in the Environmental Management Plan (EMPr).

6.4.1 Methodology Used in Ranking of Impacts

Impacts are evaluated and assessed in terms of the following criteria:

Extent of impact	Explanation of extent
Site	<i>Impacts limited to construction site and direct surrounding area</i>
Local	<i>Impacts affecting environmental elements within the local area / district</i>
Regional	<i>Impacts affecting environmental elements within the province</i>
National	<i>Impacts affecting environmental elements on a national level</i>

Duration of impact	Explanation of duration
Short term	<i>0 - 5 years. The impact is reversible in less than 5 years.</i>
Medium term	<i>5 - 15 years. The impact is reversible in less than 15 years.</i>
Long term	<i>>15 years, but where the impacts will cease if the project is decommissioned</i>
Permanent	<i>The impact will continue indefinitely and is irreversible.</i>

Probability of impact	Explanation of Probability
Unlikely	<i>The chance of the impact occurring is extremely low</i>
Possible	<i>The impact may occur</i>
Probable	<i>The impact will very likely occur</i>
Definite	<i>Impact will certainly occur</i>

Reversibility of impact	Explanation of Reversibility Ratings
Low	<i>The affected environment will not be able to recover from the impact - permanently modified</i>
Medium	<i>The affected environment will only recover from the impact with significant intervention</i>
High	<i>The affected environmental will be able to recover from the impact</i>

Significance of impact	Explanation of Significance
None	<i>There is no impact at all</i>
Low	<i>Impact is negligible or is of a low order and is likely to have little real effect</i>
Moderate	<i>Impact is real but not substantial</i>
High	<i>Impact is substantial</i>
Very high	<i>Impact is very high and can therefore influence the viability of the project</i>

6.4.2 Impact Assessment Tables

DESIGN AND PRE-CONSTRUCTION PHASE

PERMANENT LOSS OF AGRICULTURAL LAND

Impact Description

Land currently zoned “agriculture” will be lost for future farming practices. The impact should be considered in context with the following:

- Grazing of both sheep and game is the dominant agricultural land use in the area. Grazing capacity of the site is fairly low at 20 hectares per large stock unit.
- There is no cultivation in or near the project site and the surrounding area is confined to small, isolated patches of pasture or fodder crops around farmsteads.
- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment, can continue completely unhindered underneath powerlines.
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture, is insignificantly small within an agricultural environment of large farms with low density grazing. The switching station site involves 0,5ha and the laydown area 1ha.
- The affected land has very limited agricultural potential. The proposed development will have insignificant agricultural impact and should therefore be acceptable in terms of its impact on the agricultural production capability of the site.

Cumulative impact description

- The agricultural impact and the amount of agricultural land loss resulting from the proposed development is totally insignificant in the context of the agricultural environment.
- The cumulative impact of loss of agricultural land use can confidently be labelled as insignificant and not having an unacceptable negative impact on the agricultural production capability of the area.
- In terms of cumulative impact, the proposed development is acceptable and it is therefore recommended that it be approved.

Mitigation

- None is proposed.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Permanent loss of agricultural land	Site	Permanent	Definite	Low	Low	Low

Impact on Irreplaceable Resources (after mitigation)

If yes, please explain

The loss of agriculture is permanent, but when considered on light of the low agricultural potential of the land, the impact is insignificant.

Yes

NO

Cumulative impact rating (after mitigation)

If high, please explain

Low

Medium

High

RISK OF FAILURE OF STRUCTURES

Impact Description

Poor design and non-compliance with relevant legal requirement will result in structural failures and subsequent leaks with resultant negative impact that include

- electrocution of personnel

- veld fires
- damage to property
- groundwater pollution

This impact is associated with the switching station; the diesel storage facility as well as the powerlines and pylons.

Cumulative impact description

- Impact will be severe if any personnel member is electrocuted as a result of negligence and/or structural failure.
- Impact could be significant since it could extend to adjacent properties (i.e. veld fires) and could cause damage to other solar facilities and farm structures and the macro area in terms of disruption of electricity supply.
- Failure of the diesel tank installation will cause groundwater pollution.

Mitigation

- Continuous communication should take place with Eskom to ensure compliance with their most recent policies, design standards and specifications.
- A Safety Officer must be appointed to ensure compliance with the Occupational Health and Safety Act, No 181 of 1993, as amended (Responsibilities must include the provision of Personal Protective Equipment, the undertaking of safety inspections, safety awareness training, etc.)
- A Fire Management Plan must be compiled.

Diesel Storage Facility (Design considerations)-

- Compliance with SANS 10089-1:2008; Part 1: Storage and distribution of petroleum products in above-ground installations must be done.
- Provision must be made for a thick reinforced concrete spillage containment slab laid to fall to a catch pit connected to an oil/grease separator
- The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
- Spillages from the tank bund must be retained and released in a controlled manner to an oil separator.
- Allowance must be made for the removal of hazardous substances to an appropriate waste facility.
- Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines
 - Vehicle servicing area
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled prior to removal to a registered hazardous waste facility.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of failure of structures	Local	Short Term	Possible	High	Medium	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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RISK OF EROSION TO BE ADDRESSED DURING THE DESIGN PHASE

Impact Description

It is necessary to ensure that measures are in place to prevent uncontrolled stormwater with subsequent erosion causing damage to electrical infrastructure and roads and a loss of soil.

Poor stormwater planning where trucks are serviced and diesel is stored could result in groundwater contamination.

Cumulative impact description

The development footprint is small relatively small compared to the approved Du Plessis Dam Solar PV and the other renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

- Prior to the detailed design stage and implementation, a topographical survey needs to be conducted. The site drainage needs to be designed on this elevation basis, with the full consideration of the final infrastructure layout on site. The final infrastructural layout and drainage design mutually impact on each other and will therefore be an iterative process.
- The plan must ensure the following :
 - Compliance with applicable regulations
 - Prevent off-site migration of contaminated storm water or increased soil erosion.
 - Implementation of appropriate design measures that will allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows.
 - Drainage measures must promote the dissipation of stormwater run-off.
 - Contaminated stormwater must be separated from general stormwater.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of erosion	Site	Short term	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	NONE	Medium	High
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IMPACT ON TERRESTRIAL AND AQUATIC HABITAT TO BE ADDRESSED DURING THE DESIGN & PRE-CONSTRUCTION PHASE

Impact Description

In order to ensure that the proposed project is developed in an environmental sustainable manner, it is necessary to identify means to implement the EMPR, provide guidelines/specifications in terms of the design and compile relevant managements plan(s). etc. These measures must be implemented prior to commencement of construction to ensure effective implementation of the Environmental Authorisation and the EMPR. Without these measures impact could be moderate to high.

Cumulative impact description

None for the design phase.

Mitigation

Appointment of Contractors

- The EA, Generic EMPR and the Site Specific EMPR must form part of the tender documents.

Appointment of an Environmental Control Officer

- To be responsible to monitor that all requirements in terms of the Site-Specific and Generic EMPR are implemented during the construction phase.
- The ECO must ensure that all requirement as per the Environmental Authorisation is adhered to, i.e. actions required prior to commencement of construction.
- To ensure Environmental Awareness Training takes place.

Alien Invasive Management

- Compile an Alien Invasive Management Plan to be implemented during the construction and the operation phases of the

project.

Route Design

- The powerline should span the artificial dam to prevent unnecessary impact on the pylon foundations.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Terrestrial and Aquatic Habitat	Site	Short term	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	NONE	Medium	High
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IMPACT ON AVIFAUNA TO BE ADDRESSED DURING THE DESIGN PHASE

Impact Description

The key impacts associated with powerlines and birds which must be integrated with the design of the structures are mortalities resulting from electrocution and collisions during the operational phase of the project.

Cumulative impact description

The development footprint is relatively small compared to the approved Du Plessis Dam Solar PV and the other renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

The project engineers must adhere to the following:

- The most appropriate and up-to-date marking devices must be selected in consultation with the Endangered Wildlife Trust (EWT) Wildlife and Energy Programme.
- Appropriate marking devices must be attached on all spans of all new power lines in accordance with installation guidelines to increase visibility.
- 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.
- Pylon positions of the proposed lines should be staggered between the pylon positions of the existing, adjacent overhead power line where practically possible to increase visibility of both lines to flying birds.
- Perimeter or security fences should be spaced a minimum of 2.5m apart if double-layered fencing is installed to prevent entrapment of larger bodied birds that may find themselves between the fences.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on Avifauna to address during the design phase	Local	Permanent	Possible	Medium	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	NONE	Medium	High
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CONSTRUCTION PHASE

IMPACT ON NATURAL HABITAT DURING THE CONSTRUCTION PHASE

Impact description

- Loss of individuals of listed and protected plant and tree species due to clearing
- Loss of habitat or individuals of sensitive faunal species
- Loss of faunal habitat

Cumulative impact description

- Cumulative loss of habitat due to all project components
- Cumulative loss of individuals of listed and protected plant and tree species due to all project components
- Cumulative loss of individuals or habitat of sensitive fauna species due to all project components

Mitigation

Loss of natural habitat due to clearing

- Minimise vegetation clearing and disturbance to footprint areas only.
- Compile a rehabilitation programme and rehabilitate disturbed areas.
- Implement the Alien Invasive Management Plan which was compiled during the Design & Pre-Construction Phase
- Limit access to sensitive areas during construction.
- Undertake monitoring to evaluate whether further measures are required.

Loss of individuals of protected trees, protected plants or other listed species

- All mitigation measures that apply for "Loss of habitat".
- Obtain permits for protected plants that will be affected by the proposed project.

Loss of faunal habitat

- All mitigation measures that apply for "Loss of habitat".
- Avoid direct disturbance of "Depressions" occurring within the corridor.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Loss of natural habitat due to clearing	Site	Permanent	Definite	Low	Moderate	Moderate
Loss of individuals of protected trees, protected plants or other listed species	Site	Medium term	Possible	Medium	Low	Low
Loss of faunal habitat	Site	Medium term	Possible	Medium	Low	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	MEDIUM (loss of habitat)	High
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IMPACT ON AVIFAUNA DURING THE CONSTRUCTION PHASE

Impact Description

Habitat destruction

Habitat loss associated with the clearing of vegetation for road widening, lay-down areas, switching station, temporary construction facilities and pylon bases. During the construction phase some habitat destruction and alteration is inevitable. The clearing of vegetation results in the permanent loss of habitats for birds, although to a limited extent. These activities also have an impact on birds breeding, foraging and roosting in or in close proximity of the proposed developments through modification of habitat, and may result in species being displaced from the immediate area.

Servitudes and access roads associated with existing infrastructure are currently present across the site and required widening will unlikely result in significant habitat loss. The area required for pylon bases, laydown areas and switching stations is relatively small and positioned adjacent to existing infrastructure. 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.

Cumulative impact description

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. The cumulative impact of habitat destruction was considered together with habitat destruction associated with the existing infrastructure, approved solar facilities in the study area, the other grid connection components considered in this assessment as well as other renewable energy facilities in the broader area. Two operational wind energy facilities occur in the vicinity, Longyuan Mulilo De Aar 1 Wind Energy Facility (100 MW) and Longyuan Mulilo De Aar 2 North Wind Energy Facility (140 MW) located approximately 20 km to the northeast. All of these consist of additional electrical infrastructure including facility substations and power lines. Much of the cumulative impact risk therefore already exists in the area and it is unlikely that the proposed development will significantly contribute to the negative impact on bird habitat.

Impact Description

Disturbance and Displacement during Construction

Disturbances and noise from staff and construction activities can impact certain sensitive species particularly whilst feeding and breeding, resulting in indirect habitat loss through a perceived increase in predation risk.

Avifaunal species that are particularly sensitive to disturbance are unlikely to frequently utilise the site given the proximity of the site to the town of De Aar and the current impacts present in the vicinity of the site (e.g. vehicular traffic associated with the nearby quarry activities). The disturbance and displacement impacts associated with the construction phase are generally temporary in nature. The area surrounding the project site comprises contiguous, suitable natural habitat and therefore displacement distances should not incur a great energetic cost and should allow for rapid return to the site once the disturbance concludes. No nesting structures of particular relevance or sensitivity to disturbance were located on the existing transmission lines; however, several crow nests were present.

Cumulative impact description

It is considered unlikely that the disturbance associated with the construction phase of the proposed development will have a significantly negative impact on the persistence or long-term viability of avifaunal species across the project site as species particularly sensitive to this impact would likely not frequently utilise the area given the current existing impacts present.

Impact Description

Direct Mortality during Construction

Direct mortalities of avifauna due to construction activities could include roadkill of ground-dwelling species such as bustards and korhaans, poaching, entrapment, entanglement or collision with temporary infrastructure (e.g. fencing), entrapment in uncovered excavations and increased predation pressure from species such as crows.

Cumulative impact description

It is considered unlikely that the proposed development would contribute significantly to the existing impacts across the site following the implementation of mitigation measures given the proximity of the proposed development site to the town of De Aar.

Mitigation

Habitat destruction

- Existing roads should be used where possible. The minimum footprint areas of infrastructure should be used wherever possible;
- Temporary access roads should be kept to a minimum in order to limit direct vegetation loss and habitat fragmentation
- All contractors are to apply good environmental practice during construction.

Disturbance and Displacement during Construction

- Maximum use of existing access road and servitudes;
- No unnecessary off-road driving should be permitted;
- Speed limits should be strictly enforced to reduce unnecessary noise;
- 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;
- An appointed Environmental Control Officer (ECO) must be trained by an avifaunal specialist to identify the potential priority species that may occur across the development area 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 500 m of the breeding site must cease and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.

Direct Mortality during Construction

- Maximum use of existing access road and servitudes;
- Night driving must be avoided where possible;
- Any holes dug should not be left open for extended periods of time to prevent entrapment of ground dwelling birds (especially chicks) and only be dug when required and filled in soon thereafter;
- Site access should be controlled and no unauthorised persons should be allowed onto the site;
- Personnel should not be allowed to wander off the construction site;
- All personnel should undergo an initial environmental induction with regards to birds and in particular awareness about not harming or collecting species or eggs;
- The illegal collection, hunting or harvesting of birds 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;
- Perimeter or security fences should be spaced a minimum of 2.5m apart if double-layered fencing is installed to prevent entrapment of larger bodied birds that may find themselves between the fences;
- Appropriate solid-waste management should be implemented to reduce the likelihood of attracting species such as crows to the project site as increases in their numbers may impart additional predation pressure on eggs of nesting birds; and
- Any birds directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Habitat destruction	Site	Long Term	Definite	High	Low	Low
Disturbance and displacement	Site	Short term	Possible	High	Low	Low
Direct Mortality	Site	Short term	Possible	High	Low	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>)	YES	NO
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Cumulative impact rating (<i>after mitigation</i>)	LOW	Medium	High
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IMPACT ON AQUATIC HABITAT

Impact Description

Disturbance of aquatic habitat; water abstraction and water quality impacts

Cumulative impact description

Aquatic ecosystem deterioration

Mitigation

- All the proposed project activities should remain outside the recommended buffers of the delineated aquatic ecosystems in the macro area. These aquatic features should however not be at risk, since the construction activities must be confined to the corridor area.
- During the construction phase, site management must be undertaken at the laydown and construction sites. This should specifically address on-site stormwater management and prevention of pollution measures from any potential pollution sources during construction activities such as hydrocarbon spills.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on aquatic habitat	Site	Short term	Unlikely	High	Low	None

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	VERY LOW TO NONE	Medium	High
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IMPACT ON HERITAGE RESOURCES

Impact Description

Impact on archaeology

Potential damage to, or destruction of archaeological resources could occur from this project; however, no heritage resources of significance had been identified.

Impact on graves

Direct impacts to graves would occur during the construction phase when excavations and/or road building take place. Although graves have high cultural significance (hence high intensity impacts are possible), the chances of impacts occurring are minimal (almost zero) which leads to a significance of low negative. Because the locations of graves are not known, no mitigation is suggested and the significance with mitigation is thus also low negative.

Cumulative impact description

Destruction or negative impact to significant archaeological heritage within the macro area could occur. This impact is however rated as low since there are very limited conservation worthy heritage resources on site and on adjacent land.
Potential damage to, or destruction of graves from all sources could occur.

Mitigation

Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to

determine an appropriate way forward.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on archaeology	Site	Permanent	Possible	Low	Low	Low
Impact on graves	Site	Permanent	Unlikely	Low	Low	Low

Impact on Irreplaceable Resources (<i>after</i> mitigation) If yes, please explain Artefacts cannot be repaired or replaced but their loss is inconsequential in heritage terms.	YES	No
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Cumulative impact rating (<i>after</i> mitigation) If high, please explain	LOW	Medium	High
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IMPACT ON PALAEOLOGICAL RESOURCES

Impact Description

It is possible that palaeontological resources may be impacted by the proposed development. Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were a few fragments of transported silicified wood along the powerline route. Since there is a small chance that fossils from the Abrahamskraal Formation may be disturbed a Fossil Chance Find Protocol is recommended. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Cumulative impact description

Destruction or negative impact to significant palaeontological heritage within the macro area.

Mitigation

Should fossils be discovered by the contractor, developer, environmental control officer or other designated responsible person once excavations for foundations have commenced, a palaeontologist should be called to assess and collect a representative sample.

The Chance Fossil Finds Procedure is required if fossils are seen on the surface and when drilling/excavations commence:-

- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished then no further monitoring is required.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on Palaeontological Resources	Site	Permanent	Unlikely	High	Moderate	None

Impact on Irreplaceable Resources (<i>after</i> mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after</i> mitigation) If high, please explain	LOW	Medium	High
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RISK OF GROUNDWATER POLLUTION DURING THE CONSTRUCTION PHASE

Impact Description

- The risk for groundwater pollution during the construction period is generally associated with oil spills resulting from construction vehicles and placement of engineering structure.
- Poor waste management could result in unnecessary impact on groundwater and natural habitat.
- Should ineffective construction techniques and methods be used, it could lead the structural failure with associated risk to the environment.
- Increased risk for soil, groundwater and surface water pollution results mostly from poor waste management.
- Increased risk for spillages – associated with construction activities, maintenance and repair of vehicles, etc.

Cumulative impact description

Not applicable

Mitigation

Strict measures must be implemented :

- Emergency incident reporting and remedial measures must be in place
- Adequate oil containment precautions must be taken.
- A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water & Sanitation will advise in this regard.
- Small oil spills must be cleaned immediately with an oil spill kit.
- Proper maintenance procedures for vehicles and equipment must be followed.
- Servicing of vehicles may only take place in designated areas, in this case on a concrete surface within the switching station site.
- Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement.
- Measures to contain accidental spills must be readily available on site (spill kits).
- All hazardous substance spills must be reported to the Contractor and the ECO, recorded and investigated.

Waste Management Procedures must include the following:-

- General household waste (i.e. strict control over labourers; no burning or burying of waste; provision of dustbin and garbage bags; regular removal preferably by municipal waste removal; etc.)
- Construction waste (i.e. stringent daily clean-up and either disposal at registered waste site or preferably sold for recycling purposes)
- Sewage waste (labourers to be provided with proper ablution facilities- chemical toilets must be provided and serviced by a reputable outside company; no effluent to be dumped on adjacent land). Written proof of servicing of the chemical toilets must be obtained and kept on site in the ECO file.
- Hazardous waste (i.e. oil contaminated waste to be moved to registered hazardous waste landfill site; adequate storage and labelling of hazardous materials on site). Stormwater should not be discharged into the working areas and it should be ensured that stormwater leaving the footprint of the proposed development areas is not contaminated by any substance, whether that substance is solid, liquid, vapour or any combination thereof. Way slips or written proof of disposal at an appropriately registered waste facility must be obtained and kept on site in die ECO File.

- Refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of groundwater pollution	Local	Medium	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium	High
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RISK OF EROSION DURING THE CONSTRUCTION PHASE

Impact Description

- To cause the loss of soil by erosion is an offence under the Soil Conservation Act, Act No 76 of 1969.)
- The impact will occur where large areas of land are exposed and where stormwater is allowed to cascade freely across the site.
- Construction vehicles and insufficient construction roads could also result in erosion.

Cumulative impact description

Medium (erosion may spread), however the application of mitigation measures will minimise this impact to acceptable levels.

Mitigation

- It is recommended that access and service roads, as well as stormwater systems are constructed at the commencement of the construction phase to ensure that suitable stormwater management measures are in place at the least additional cost.
- In order to preserve the natural state of the surface and vegetation as far as practically possible, off-road driving should be restricted to the absolute essential.
- Space for lay-down areas for construction material and for construction facilities is restricted on site. The following should be taken into account:
 - Temporary or permanent soil stockpiles should be placed in such a way to minimise the impact on surface flow.
 - High resolution site survey data must be used to design stormwater ditches to direct surface flood water past any stockpiles.
 - Site clearing should be limited to the essential.
- Construction waste must be collected and stored safely for disposal in accordance with the relevant waste regulations, protocols, and product specifications. Care must be taken not to leave any waste on site that can lead to future contamination of the site.
- Refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Increased risk of erosion	Local	Medium	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium	High
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IMPACT OF AN UNCONTROLLED LABOUR FORCE

Impact Description

- An influx of workers could result in an increased risk for crime and safety to the adjacent landowners.
- Uncontrolled labourers would cause disturbance to and destruction of natural habitat i.e. through placement of snares, cutting trees of firewood, etc.
- Damage to the farmers' property can have a severe economic as well as environmental impact.

Cumulative impact description

When seen in context with other developments within the area, the cumulative impact could be significant severe. However, when mitigation measures have been applied the impact will be reduced to acceptable levels.

Mitigation

- Labourers should be trained in general principles of environmental awareness by the ECO that includes the following :
 - Removal of agricultural products is prohibited.
 - No plants may be collected.
 - No firewood may be collected.
 - No open fires are to be made.
 - No wandering on adjacent properties is allowed.
 - No access to the watercourse areas is allowed.
 - No watercourse may be used for any purpose (i.e. drinking water, washing, laundry, etc.)
 - The veld may not be used for any toilet needs.
 - Secure accommodation facilities must be provided for guarding personnel (if applicable).
 - Supervision of labourers must at all times take place.
- Also refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Uncontrolled labour force	Local	Short	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
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Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium	High
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IMPACTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES SUCH AS NOISE AND DUST (AIR QUALITY)

Impact Description

Construction activities are generally associated with noise and dust. This impact should however be considered in context with the rural nature of the surrounding areas as well as the remoteness of the site.

Cumulative impact description

The cumulative impact for noise and dust will be minimal due to the remoteness of the site.

Mitigation

- Refer to the *Generic EMPr*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Noise	Site	Short	Possible	High	Moderate	Low
Dust	Site	Short	Possible	High	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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POST-CONSTRUCTION & OPERATIONAL PHASE

CONTINUOUS IMPACT ON THE NATURAL HABITAT

Impact Description

Invasion by alien invasive plant species as a result of disturbance (equal risk for both options).

Cumulative impact description

Cumulative invasion due to all project components is possible.

Mitigation

- The Alien Invasive Management Plan compiled during the Design & Pre-Construction Phase must be implemented.
- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.
- Refer to the *Generic EMP*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Continuous impact on the natural habitat	Local	Long Term	Probable	Medium	Moderate	Low

Impact on Irreplaceable Resources (after mitigation) If yes, please explain	Yes	NO
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Cumulative impact rating (after mitigation) If high, please explain	LOW	Medium	High
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IMPACT ON AVIFAUNA DURING THE OPERATIONAL PHASE

Impact Description

Disturbance and Displacement:-

Disturbance and displacement of birds may occur during operational activity of the switching stations as well as during the periodic maintenance that is required of the servitude and power line infrastructure. The grid connection infrastructure may also require aerial inspection or maintenance. The disturbance of avifauna during the operational phase, while ongoing, is not continuous.

Cumulative impact description

Disturbance and Displacement:-

It is considered unlikely that the disturbance associated with the operational phase of the proposed development will have a significantly negative impact on the persistence or long-term viability of avifaunal species across the project site as species particularly sensitive to this impact would likely not frequently utilise the area given the current existing impacts present. Any disturbed species have a very high likelihood of returning to a site once the disturbance or impact has been removed given that suitable available habitat is widespread in the surrounding area. Disturbance and displacement due to operational activity associated with the proposed development is not expected to be significant as routine maintenance of existing transmission infrastructure already occurs along the existing servitude and any birds that remain in the area are likely to be habituated to the operational activity of facilities approved nearby.

Impact Description

Direct Mortality during Operation: Collisions

Collisions with large (>132 kV) power lines are a well-documented threat to avifauna in southern Africa¹³ while smaller lines pose a higher threat of electrocution but can still be responsible for collision. This impact is already present across the proposed development site. 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. Heavy-bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability are especially susceptible to this impact. Ludwig's Bustard and Kori bustard are known to be particularly prone to collision¹². However, collisions are significantly more likely to occur away from roads¹² and the portions of the proposed routes that are not adjacent to existing overhead power lines run adjacent to the road. The installation of flappers and bird flight diverters (BFDs) may increase the visibility of the proposed power lines, however while this has been shown to reduce the number of collisions for many species it does not appear to be effective at preventing bustard collisions¹⁴. To a lesser extent, collisions, entrapment or entanglement can also occur from perimeter security fencing. If double-layered fences are to be used larger-bodied birds can find themselves between the fences and unable to escape if the clearances between the fences are insufficient to allow for take-off.

Cumulative impact description

Direct Mortality during Operation: Collisions

This impact is already present across the proposed development site. The proposed power line routes largely run adjacent to existing power lines. The majority of the spans of existing overhead power lines do not include bird flight diverters and support pylons are largely adjacent to each other where multiple lines are parallel. The considered placement of pylons (i.e. staggered relative to adjacent lines) and addition of bird flight diverters on the proposed overhead power lines present an opportunity to reduce the overall cumulative impact of collisions to species such as Ludwig's Bustard in the area. The installation of flappers and bird flight diverters may 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.

Impact Description

Direct Mortality during Operation: Electrocution with Energized Infrastructure

causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components¹⁵. 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 within the proposed switching station are possible but should not affect the more sensitive species, as these species are unlikely to use the infrastructure within the switching station yard for perching, nesting or roosting. The electrocution risk is considered to be of low probability and therefore low significance, the impact can be further reduced if mitigation measures are adhered to.

Cumulative impact description

Direct Mortality during Operation: Electrocutation with Energized Infrastructure

The proposed development is unlikely to have a significant contribution to the cumulative impact of the area with respect to direct mortalities resulting from electrocutions. This impact can be effectively mitigated.

Mitigation:

Disturbance and Displacement

- Maximum use of existing access road and servitudes;
- No unnecessary off-road driving should be permitted;
- A speed limit of 30km/h is proposed for movement on private farm roads and should be enforced to reduce unnecessary noise and risk of bird fatalities;
- 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;
- An appointed Environmental Manager must be trained by an avifaunal specialist to identify the potential priority species that may occur across the development area as well as the signs that indicate possible breeding by these species;
- The Environmental Manager 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), maintenance activities (E.g. vegetation clearing and aerial surveys) within 500 m of the breeding site must cease and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.

Direct Mortality during Operation: Collisions

There is opportunity to potentially reduce the risk of collision associated with the proposed and adjacent, existing power line by attaching flappers and bird flight diverters to the proposed line (as per requirement in the Design & Pre Construction Phase);

- Flappers and BFDs must be maintained and replaced where necessary, for the life span of the project;
- An operational monitoring programme must include regular monitoring of the entire length of the power lines and perimeter fences for collision incidents for the lifespan of the project; and
- Collision incidents must be recorded and reported to the Endangered Wildlife Trust (EWT).

Direct Mortality during Operation: Electrocutation with Energized Infrastructure

- An operational monitoring programme must be implemented and include regular monitoring of the power lines and switching stations for electrocution incidents (this can be done simultaneously with the collision monitoring) and integrity of anti-perch devices and insulated components; and
- Any mortality must be reported to the EWT.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Disturbance and Displacement	Site	Long term	Possible	High	Low	Low
Direct Mortality during Operation: Collisions	Site	Long term	Possible	High	Low	Low
Direct Mortality during Operation: Electrocutation with Energized Infrastructure	Site	Long term	Possible	High	Low	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>)	Yes	NO
If yes, please explain		

Cumulative impact rating (<i>after mitigation</i>)	LOW	Medium	High
If high, please explain			

IMPACT ON AQUATIC HABITAT DURING THE OPERATION PHASE

Impact Description

Degradation of the ecological condition of aquatic ecosystems; modification of flow; erosion; and alien vegetation invasion in aquatic features

Cumulative impact description

Aquatic ecosystem deterioration can take place.

Mitigation

- Invasive alien plant growth and signs of erosion should be monitored on an ongoing basis to ensure that the disturbed areas do not become infested with invasive alien plants.
- Stormwater run-off infrastructure must be designed to mitigate the flow impacts of any stormwater leaving developed areas. The run-off should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate shaping with berms, channels and swales.
- Should any erosion features develop, they should be stabilised as soon as possible.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Impact on Aquatic Habitat	Site	Short term	Unlikely	High	Low	None

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
--	-----	----

Cumulative impact rating (<i>after mitigation</i>) If high, please explain	VERY LOW TO NONE	Medium	High
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RISK OF EROSION DURING THE OPERATIONAL PHASE

Impact Description

Diligence in stormwater management is essential and a full-time task, even during dry periods. Any lack of care may lead to the slow degrading of the site, rendering it susceptible to severe damage in the event of unexpected flooding, and subsequent potential damage to equipment on site due to gradual erosion due to normal rainfall events, or by unexpected huge damage due to random extreme flood events.

Based on the slope gradient and soil erodibility index the water erosion susceptibility class is a moderating sloping land with soils of very high erodibility hazard. The prevalence of the very sandy soil and the low annual rainfall of less than 200 mm results in low plant biomass production and low soil organic material, rendering the land susceptible to wind erosion.

Cumulative impact description

The development footprint is small relatively small compared to the approved Du Plessis Dam Solar PV1 and the other renewable energy projects in the macro area and the cumulative impact is therefore expected to be of low/negligible significance.

Mitigation

- The storm water management plan for the switching station (that includes the diesel storage facility) compiled during the Design & Preconstruction Phase must be implemented continuously during the operation of the facility.
- Regular monitoring must take place and should areas of erosion be detected, actions must be identified and implemented to rectify the situation. Also refer to the *Generic EMP*

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk of Erosion	Local	Medium	Likely	High	High	Low

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium High

CONTINUOUS RISK FOR GROUNDWATER POLLUTION DURING THE OPERATIONAL PHASE

Impact Description

Spillages could occur with increased risk for groundwater pollution. This could typically happen during the transfer of petroleum product from road tanker to the storage tanks or during the servicing of maintenance and inspection vehicles. Leaks could occur with resultant pollution of groundwater. This would typically occur if structural failure happens or if appropriate waste management procedures are not followed.

Cumulative impact description

Impact is localised and no cumulative impact is expected.

Mitigation

- Prevent impact rather than manage impact:
 - Permanent staff as well as maintenance and inspection personnel must be appropriately trained in terms of waste management, specifically with regards to hazardous waste, inclusive of risk associated with the diesel storage facility, vehicle maintenance, etc. Appropriate Personal Protective Equipment (PPE) must at all times be provided.
 - Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines.
 - The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
 - Spillages from the tank bund must be retained and released in a controlled manner to an oil separator from where it could be temporarily stored and
 - The storage tank must be fully contained within the bunded area to contain spillage of hydrocarbons and contaminated rainwater and prevent the ingress of hydrocarbon spillages and contaminated rainwater into the ground or surface water.
 - Provision must be made for a thick reinforced concrete spillage containment slab laid to fall to a catch pit connected to an oil/grease separator.
 - Spillages of hydrocarbons and contaminated water must be collected from the following areas :
 - Diesel tank bunded area
 - Product receiving station and receiving pipelines
 - Vehicle servicing area
 - Proper maintenance procedures for vehicles and equipment must be followed.
 - Servicing of vehicles may only take place in designated areas, in this case on a concrete surface within the switching station site.
 - Drip trays should be used during the servicing of vehicles. The content thereof must be disposed in accordance with relevant hazardous material disposal requirement.
 - As part of routine maintenance, the Applicant must undertake regular engineering inspections of the tank, tank valves and pumps to ensure that there are no leaks.
- Hydrocarbon (oil, diesel, petrol) waste as well as hydrocarbon containing material must be regarded as hazardous waste and separated from general waste.
- All hazardous substances at the site must be adequately stored and accurately identified, recorded and labelled prior to removal to a registered hazardous waste facility.
- Provide measures for emergency incident reporting and remedial measures and personnel must be appropriately trained.

- A bio-remediation contractor must be appointed to rehabilitate large oil spills. The regional officer of the Department of Water & Sanitation will advise in this regard.
- Small oil spills must be cleaned immediately with an oil spill kit. Measures to contain accidental spills must always be readily available on site (spill kits).
- All hazardous substance spills must be reported to the Contractor and the ECO, recorded and investigated.
- Follow acceptable maintenance and operational practises to ensure consistent, effective and safe performance of the infrastructure
- Also refer to the *Generic EMPr*.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Risk for Groundwater pollution	Site	Short term	Possible	High	Moderate	None

Impact on Irreplaceable Resources (<i>after mitigation</i>) If yes, please explain	Yes	NO
Cumulative impact rating (<i>after mitigation</i>) If high, please explain	LOW	Medium High

6.4.3 Environmental Management Programme (EMPr)

The main objectives of the EMPr are to identify actions and mitigation measures to minimise expected negative impact and enhance positive impact during all development phases (design/pre-construction, construction, and post-construction/operation) in terms of community issues, construction site preparation, construction workers, habitat protection, security, etc. Communication channels and contact details must also be provided.

According to the NEMA 2014 Regulations, as amended Appendix 4, an EMPr must comply with section 24N of the Act and includes:

- Details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;
- a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-
 - Planning and design;
 - Pre-construction activities;
 - Construction activities;
 - Rehabilitation of the environment after construction and where applicable post closure;
 - and
 - where relevant, operation activities;
- a description and identification of impact management outcomes required for the aspects contemplated

- in paragraph (d);
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to
 - (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - (ii) comply with any prescribed environmental management standards or practices;
 - (iii) comply with any applicable provisions of the Act regarding closure, where applicable;
 - (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
 - (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
 - (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);
 - (i) an indication of the persons who will be responsible for the implementation of the impact management actions;
 - (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
 - (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
 - (l) a program for reporting on compliance, taking into account the requirements as prescribed by the regulations;
 - (m) an environmental awareness plan describing the manner in which-
 - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
 - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
 - (n) any specific information that may be required by the competent authority.

Identified impacts and mitigation / management outcomes will be monitored through the application of the Environmental Management Programme (EMPr) that is included as Appendix G of this Basic Assessment Report.

6.5 Conclusion of Impact Assessment

6.5.1 Summary of Impact Assessment Tables

Design and Pre-construction Phase

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Permanent loss of agricultural land	Site	Permanent	Definite	Low	Low	Low
Risk of failure of structures	Local	Short Term	Possible	High	Medium	Low
Risk of erosion	Site	Short term	Possible	High	Moderate	Low

Terrestrial and Aquatic Habitat	Site	Short term	Possible	High	Moderate	Low
Impact on Avifauna to address during the design phase	Local	Permanent	Possible	Medium	Moderate	Low

Construction Phase

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Loss of natural habitat due to clearing	Site	Permanent	Definite	Low	Moderate	Moderate
Loss of individuals of protected trees, protected plants or other listed species	Site	Medium term	Possible	Medium	Low	Low
Loss of faunal habitat	Site	Medium term	Possible	Medium	Low	Low
Avifauna: Habitat destruction	Site	Long Term	Definite	High	Low	Low
Avifauna: Disturbance and displacement	Site	Short term	Possible	High	Low	Low
Avifauna: Direct Mortality	Site	Short term	Possible	High	Low	Low
Impact on aquatic habitat	Site	Short term	Unlikely	High	Low	None
Impact on archaeology	Site	Permanent	Possible	Low	Low	Low
Impact on graves	Site	Permanent	Unlikely	Low	Low	Low
Impact on Palaeontological Resources	Site	Permanent	Unlikely	High	Moderate	None
Risk of groundwater pollution	Local	Medium	Possible	High	Moderate	Low
Increased risk of erosion	Local	Medium	Possible	High	Moderate	Low
Social: Uncontrolled labour force	Local	Short	Possible	High	Moderate	Low
Social Noise	Site	Short	Possible	High	Moderate	Low
Dust	Site	Short	Possible	High	Moderate	Low

Post-Construction and Operational Phase

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Continuous impact on the natural habitat	Local	Long term	Probable	Medium	Moderate	Low
Avifauna: Disturbance and Displacement	Site	Long term	Possible	High	Low	Low
Avifauna: Direct Mortality during Operation: Collisions	Site	Long term	Possible	High	Low	Low
Avifauna: Direct Mortality during Operation: Electrocution with Energized Infrastructure	Site	Long term	Possible	High	Low	Low
Impact on Aquatic Habitat	Site	Short term	Unlikely	High	Low	None

Risk of Erosion	Local	Medium	Likely	High	High	Low
Risk for Groundwater pollution	Site	Short term	Possible	High	Moderate	None

6.5.2 Conclusion

- As can be seen from the summary tables above, while some potential impacts had a moderate or high significance rating prior to mitigation, all identified impacts can be mitigated to acceptable levels (i.e. Low significance).
- The impacts assessed include issues raised by the different specialists as well as other impacts as identified by the EAP.
- All natural, social and cultural functions and processes will be able to continue *after* mitigation measures have been applied.
- No substantial impact *after* mitigation has been applied is expected to occur.
- The impacts after mitigation has been applied can, in general, be seen as minimal.
- All the mitigation measures are deemed feasible, and realistic to implement, and are included in the Environmental Management Programme, which means that the Applicant is legally bound to follow the recommendations should EA be granted.

CHAPTER 7: CONCLUSION

7.1 Assumptions, Uncertainties, and Gaps in Knowledge

Assumptions

It is assumed that all documentation and information obtained from the different stakeholders, professional team members and specialists are accurate, unbiased and valid.

Uncertainties

The development proposal in relation to its environment was thoroughly investigated by various specialists and professionals and there are therefore no uncertainties with regards to the development as proposed.

Gaps in knowledge

No obvious gaps in knowledge are known. It is not foreseen that any information not included in the report will change the outcome of the recommendations

7.2 Environmental Impact Statement

7.2.1 Key findings

Specialist studies, landowner negotiations and public participation were undertaken for this project and the following is applicable:

Specialist studies

The switching station site, laydown area and a 300m power line route corridor were investigated by the specialist team (fauna & flora, aquatic, bird, social and heritage). These studies concluded that all expected negative impacts can be mitigated to acceptable levels. The preferred alternative is supported by all the specialists. The following is a summary of their key findings.

Terrestrial Ecological Specialist Assessment

- The regional vegetation type that occurs on site and in surrounding areas is not listed or of conservation concern.
- The corridors are both partially within a Critical Biodiversity Area 2 and partially within an Ecological Support Area (ESA), the latter of which extends across vast distances in all areas close to De Aar. There are therefore no options outside of this ESA for the project, and the CBA² area is the location of the associated solar PV project, which has already been authorised.
- No plant species of concern were found on site. One rare plant species, *Tridentea virescens*, could potentially occur in the general area but was not seen. It occurs across a very wide geographical area and loss of a small area of habitat will not affect the species.

- One protected amphibian, the Giant Bullfrog (*Pyxicephalus adspersus*), was found on site. The observation was within the Alternative 2 corridor in a specific location where it is likely to be resident. Loss of a small area of habitat for the proposed projects will not adversely affect the species, but it would be preferable to avoid impacts, if possible. From this perspective, Alternative 1 (preferred) is therefore marginally preferred here.
- Impacts of the proposed project components are relatively insignificant in comparison to the variety of approved solar PV projects within the immediate surroundings.

Aquatic Specialist Impact Assessment

The proposed grid connection and switching station for PV1 are located outside of the wider floodplain area of a Brak River Tributary that lies to the north-east and east of the project activities. Some minor watercourses of low ecological sensitivity occur near the route that is of low sensitivity and have poorly defined channels and little associated aquatic habitat and biota. The proposed activities are thus unlikely to have any impact on these aquatic features.

The potential aquatic biodiversity impacts of the proposed activities are likely to be negligible in terms of any potential impact to aquatic habitat, biota, water quality, or flow for all phases of the proposed development.

Both route alternatives assessed would have same potential aquatic ecosystem impacts that are of negligible significance.

Avifauna Specialist Impact Assessment

The total area of habitat destruction associated with the footprint of the grid connection and associated infrastructure is relatively small compared to the proportion of habitat available in the area, and does not represent a fatal flaw that would prevent the proposed development from proceeding. As the majority of the proposed power line corridors assessed run adjacent to existing power lines, which are largely 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 and could potentially reduce the overall risk to birds.

The proposed project is unlikely to impose significant impacts on the avifauna of the receiving environment. No significant negative impacts have been identified and therefore the project can be authorised from an avifaunal perspective.

Heritage Impact Assessment

Three sites of mixed age scatters of hornfels flaked artefacts were identified – one along the preferred corridor and two along the 2nd corridor alternative. They are however of very low significance and do not require any mitigation.

The landscape was found to be heavily dominated by existing electrical infrastructure which forms a new layer on the landscape. The new developments will thus be in keeping with this land use and will not introduce any new or significant impacts.

Palaeontological Impact Assessment

Based on the fossil record but confirmed by the site visit and walk through there are only a few scattered pieces of transported silicified fossil wood even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the shales of the Tierberg and the Abrahamskraal Formations so a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the environmental officer or other responsible person once excavations and drilling have commenced, it should be rescued and a palaeontologist called to assess and collect a representative sample.

Social Impact Assessment

The development of renewable energy and the associated energy infrastructure is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy and associated energy distribution infrastructure is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all highlight the importance of energy security and investment in energy infrastructure. The development of the proposed power line is therefore supported by key policy and planning documents.

The key positive social impact associated with the project is the creation of employment and business opportunities, as well as the opportunity for skills development and on-site training.

The findings of the study indicate that the significance of the potential negative social impacts for both the construction and operational phase of the proposed 132 kV Du Plessis Dam Solar PV1 overhead power line is *Low Negative* with mitigation. This applies to both Alternative 1 (Preferred Alternative) and Alternative 2.

The energy security benefits associated with the proposed Du Plessis Dam Solar PV1 are dependent upon it being able to connect to the national grid via the establishment of grid connection infrastructure. The establishment of proposed 132 kV grid connection for the Du Plessis Dam PV1 is therefore supported by the findings of the Social Impact Assessment.

A **Combined Environmental Sensitivity Map** is provided in Appendix B(3). It confirms the following in terms of the preferred route alternative:-

- Terrestrial Biodiversity – no constraints, general mitigation measures are proposed
- Aquatics - no constraints, general mitigation measures are proposed
- Avi-fauna – no constraints, general mitigation measures are proposed
- Heritage Impact – no constraints, general mitigation measures are proposed
- Palaeontology – no constraints, Chance Find Protocol Procedure is proposed
- Social – no constraints, general mitigation measures are proposed.

Public Participation

The public participation process followed was approved by DFFE on 11 February 2022. The Draft BAR (this document) has now been distributed for public review and input.

The main objective of the Public Participation Programme undertaken for this project is to identify a viable development site that is not only acceptable from an ecological point of view, but also from a landowner and public perspective.

Comment/objections received will be carefully assessed and addressed in the Final BAR. No objections had been received up to date. It is also not expected that objections will be received due to the numerous solar farms and associated infrastructure projects in the macro area. Powerlines and electrical infrastructure form part of the landscape of De Aar. It is no longer unwanted in the area.

7.2.2 Impact Assessment

The main potential negative impacts associated with the project are the following:

Expected Negative Impacts

Planning and Design Phase

- Permanent loss of agricultural land
- Risk of failure of structures
- Risk of erosion
- Impact on terrestrial and aquatic habitat
- Impact on avifauna

Construction Phase

- Impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Impact on heritage resources
- Impact on palaeontological resources
- Risk of groundwater pollution
- Risk of erosion
- Impact of an uncontrolled labour force
- Noise and dust (air quality)

Post- Construction / Operational Phase

- Continuous impact on natural habitat
- Impact on avifauna
- Impact on aquatic environment
- Risk of erosion
- Continuous risk of groundwater pollution

It was concluded that, after the application of proposed mitigation measures, all negative impacts can be mitigated to acceptable levels. This is illustrated in the summarised tables provided in Paragraph 6.5.1.

Expected positive impacts

- The proposed Du Plessis Solar PV1 Grid Connection will be able to evacuate the electricity by the Du Plessis Dam Solar PV1 into the national grid.
- All the advantages of additional, clean, renewable electrical supply to the national Eskom grid will be realised. An opportunity to reduce South Africa's very high carbon emissions will be utilised.
- Employment and business opportunities with the opportunity for skills development and on-site training will be created through the establishment of the Du Plessis Dam Solar PV1 facility which include the proposed grid connection.

7.2.3 Alternatives

Both the proposed and preferred corridor for the Du Plessis Dam Solar PV1 Grid Connection (inclusive of the 132kV powerline, the switching station and the laydown area will have a minimal negative impact on the environment with the implementation of proposed mitigation measures.

Comparison of route alternatives (to be read with the specialist reports summarised in Chapter 4)

Component	Route Alternative 1	Route Alternative 2
Technical Preference	Preferred	Acceptable
Terrestrial Ecological Impact	Alternative 1 is preferred	Acceptable
Avifauna impact	Alternative 1 is preferred	Acceptable
Aquatic environment	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Heritage Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Palaeontological Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference
Social Impact	Both routes are acceptable, no preference	Both routes are acceptable, no preference

The eastern (preferred) alternative powerline corridor is preferred from a technical point of view (as confirmed during discussions between Eskom and the Applicant as well as an avifauna and terrestrial ecological impact. There are no environmental constraints associated with the preferred powerline route. The assessment of any further alternative sites or routes is therefore not justifiable from a technical and/or environmental point of view. The EAPs are confident that the infrastructure and preferred powerline corridor as presented is acceptable and viable.

7.2.3 Conclusion of Environmental Impact Statement

The EAPs are confident that the proposed Du Plessis Dam Solar PV1 Grid Connection could be authorised, based on the following:-

- The proposed Du Plessis Dam Solar PV1 Grid Connection is planned in a legal, pro-active and structured manner taking all development components, potential and restrictions into account.
- All relevant legal requirement in terms of the Environmental Impact Assessment Regulations published in 2014, as amended were complied with. This Basic Assessment Report includes all

- relevant proceedings, findings and recommendations which resulted from this study.
- The specialist input obtained is comprehensive and effective in providing an assessment of the status quo of the study area, identifying potentially sensitive areas and issues of concern as well as identifying impact that require re-consideration of alternatives.
 - Significant and reasonable actions were taken to identify and notify all Interested & Affected Parties that include government departments, relevant authorities, general stakeholders and potentially affected landowners of the project. No objections had been received regarding this project.
 - The infrastructure and preferred alternative as motivated and recommended for authorisation in this document will, after the application of mitigation measures, have a minimal and acceptable impact on the environment. This will be accomplished through the implementation of the mitigation measures specified in the Environmental Management Programme (EMPr) that is included as Appendix G of the Basic Assessment Report.
 - The EAPs are confident that the infrastructure and preferred route alternative as presented is acceptable and viable. The assessment of additional alternative sites and/or routes is not justified.
 - There is no reason from a technical, environmental and social perspective why the preferred powerline corridor could not be authorised.

7.3 Period for which the EA is required

This period is from the date of which the EA has been issued until the end of all construction activities. A period of 10 years is required – this will allow for any unforeseen circumstances.

7.4 Recommendation by the Environmental Assessment Practitioner

It is recommended that Environmental Authorisation be granted to the **Du Plessis Dam Solar PV1 (Pty) Ltd** for the preferred route for the **Du Plessis Dam Solar PV1 Grid Connection** which entails the construction of a switching station with associated infrastructure (inclusive of a diesel storage facility) and an approximate 8km 132kV power line that will connect the Du Plessis Dam Solar PV1 facility to the Mulilo Cluster 1 Substation.

It is required that the following be considered for inclusion in the Environmental Authorisation:

- A power line route corridor of 300m was assessed and it is requested that the *corridor* be approved as part of the environmental authorisation and not the servitude only. This will allow for reasonable adjustments within the corridor during the final design phase of this project without having to go through another environmental authorisation process. Only the required 31m wide servitude will be registered within the route corridor, not the entire corridor.
- It is required that the Site-Specific Environmental Management Programme be approved as part of the Environmental Authorisation.
- The Environmental Authorisation must be valid for a period of 10 years.

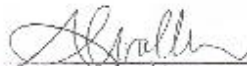
7.5 Affirmation by the Environmental Assessment Practitioner

UNDERTAKING UNDER OATH / AFFIRMATION

DU PLESSIS DAM SOLAR PV1 GRID CONNECTION

I, Annelize Erasmus, swear under oath / affirm the following:

- The information contained in this report is to the best of our knowledge and experience correct.
- All relevant comment and input provided by the stakeholders and IAPs are included and addressed in this BAR.
- Input and recommendations from the specialist reports are provided in and integrated with the BAR.
- All information made available by the EAP to IAPs and any responses thereto as well as comment and input from IAPs are provided in the BAR.



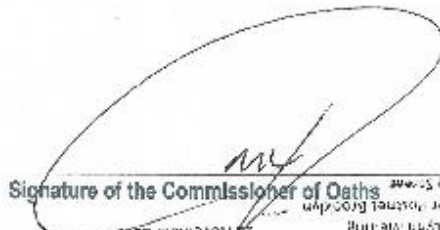
Signature of the Environmental Assessment Practitioner

Landscape Dynamics Environmental Consultants (Pty) Ltd

Name of Company

17 May 2022

Date



Signature of the Commissioner of Oaths

Commissioner of Oaths Ref no: 92/8/2 Pragma
121 Kloofstraat
Rondebosch, Cape Town
1056 (Tel: 021 794 9500)

17/05/2022

Date