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Draft EIA Report

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**PROPOSED RENEWABLE ENERGY GENERATION PROJECT
(PHOTOVOLTAIC PLANT) ON PORTIONS 1 AND 4 OF FLORIDA
633, REMAINDER OF LE ROUX 766 AND REMAINDER OF
KRIEGERS KRAAL 708, VENTERSBURG RD, AND
CONNECTING POWERLINES, MATJHABENG & MASILONYANA
LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT
MUNICIPALITY, FREE STATE PROVINCE**

Short name: Florida Solar Park

31 July 2023

Commissioned by: Piscis Energy (Pty) Ltd
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Compiled A von Well



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MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA
DISTRICT MUNICIPALITY, FREE STATE PROVINCE**

Short name: Florida Solar Park

31 July 2023

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EXECUTIVE SUMMARY

Piscis Energy (Pty) Ltd (Reg. No. 2022/847640/07) is proposing the development of a Photovoltaic (PV) Solar Energy Facility and associated infrastructure located approximately 12 km southeast of Virginia town and ±22 km South-West of Ventersburg in the Free State Province. The proposed PV facility (**Florida Solar Park**) will be located on:

- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD;
- Remainder of the Farm Le Roux 766 Ventersburg RD; and
- Remainder of the Farm Kriegers Kraal 708, Ventersburg RD.

within the Matjhabeng Local Municipality, Lejweleputswa District Municipality, Free State Province.

The following properties fall within the Powerline Study Corridor and will be crossed by the proposed **Florida 132 kV powerline**, according to the proposed alignment:

- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD.

The new **Florida 132/400kV substation and 400kV switching station** is planned to be located on Portion 1 of the Farm Florida 633, Ventersburg RD, within the Powerline Study Corridor.

The following properties fall within the Powerline Study Corridor and will be crossed by the proposed **Florida 400 kV powerline**, according to the proposed alignment:

- Portion 1 of the Farm Florida 633, Ventersburg RD;
- Portions 2 (Remaining Extent), 22 (Remaining Extent) and 24 of the Farm Welgelegen 382, Theunissen RD;
- Remainder, Portion 2 (Remaining Extent), Portions 3 and 8 of the Farm Bloemhoek 509, Theunissen RD;
- Portions 11 and 21 (both unregistered from the Remainder) of the Farm Doorn River 330, Theunissen RD; and
- Portion 6 of the Farm Doorn River 330, Theunissen RD (Eskom Theseus substation);

located within the Matjhabeng and Masilonyana Local Municipalities, Lejweleputswa District Municipality, Free State Province.

The proposed development area is approximately **365 ha** and the Photovoltaic (PV) Power Plant and its connection infrastructure consists of the installation of the following equipment:

- PV modules (mono-crystalline or poly-crystalline, mono-facial or bi-facial modules)
- Mounting systems for the PV arrays (single-axis horizontal trackers or fixed structures) and related foundations
- Internal cabling and string boxes
- Medium voltage stations, hosting DC/AC inverters and LV/MV power transformers
- Medium voltage receiving station(s)

- Workshops & warehouses
- One on-site high-voltage substation with high-voltage power transformers, stepping up voltage from 22 kV (or 33 kV) to 132 kV, and one 132k V busbar with metering and protection devices (switching station).
- The **Florida 132 kV power line (double circuit)**, approximately **3.3 km long** for the connection of the on-site substation to the new “Florida 132kV/400kV Substation and 400kV Switching Station”.
- The new “**Florida 132kV/400kV Substation and 400kV Switching Station**” (shared infrastructure), planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD**, collecting the 132kV powerlines coming from Florida, Corona, Quagga and Virginia 4 Solar Parks.
- The **Florida 400 kV powerline, 5.9 km long**, connecting the new Florida 400kV Switching Station to the Eskom Theseus Main Transmission Substation.
- **Battery Energy Storage Systems (BESS)**, with a Maximum Export Capacity up to **170 MW** and up to 6-hour storage capacity of **1,020 MWh**, with a footprint of **15 ha**, next to the on-site high-voltage substation, within the PV plant footprint / fenced areas.
- Electrical system and UPS (Uninterruptible Power Supply) devices
- Lighting system
- Grounding system
- Direct access from the Regional Road R73
- Internal roads
- Fencing of the site and alarm and video-surveillance system
- Water access point, water supply pipelines, water treatment facilities
- Patented Sewage system

During the construction phase, the site may be provided with additional:

- Water access point, water supply pipelines, water treatment facilities
- Pre-fabricated buildings
- Workshops & warehouses

to be removed at the end of construction.

The connection may entail the extension of the 400 kV busbar of the Eskom Theseus MTS for the establishment of new 400 kV bus-bays, according to Eskom’s connection requirements/solution.

Evaluation of the Florida Solar PV facility

The following chapters of the Draft EIA Report together with the specialist studies contained in Annexures D – Q provide a detailed assessment of possible impacts the proposed Florida Solar PV facility and power line may have on the environment. This chapter contains the environmental assessment of the solar PV facility and power line by providing a summary of the results and conclusions of the assessment of both the project

site and development footprint. In so doing, it draws on the information gathered as part of the Environmental Impact Assessment (EIA) process, knowledge gained by environmental specialists and EAP and presents a combined and informed opinion of environmental impacts associated with the proposed development.

No environmental fatal flaws or unacceptable impacts were identified by environmental specialists, provided that recommended mitigation measures are implemented during construction and operational phases. Mitigation measures include, amongst others, the avoidance of sensitive areas within the development footprint.

The potential environmental impacts associated with the Florida Solar PV facility identified and assessed through the EIA process include:

- Impacts on Terrestrial Biodiversity, vegetation and animals;
- Impacts on Wetlands, Drainage Channels and Aquatic Ecology;
- Impacts on Avifauna;
- Visual Impacts;
- Socio-economic Impacts;
- Impacts on Land Use, Soil and Agricultural Potential;
- Impacts on Heritage Resources and Palaeontological Resources
- Impacts of Civil Aviation aspects
- Radio Frequency Interference
- Impacts on Traffic.

Impacts on Ecology

A Terrestrial Biodiversity Impact Assessment was conducted to describe the ecology (fauna and flora) present in the site, to assess its ecological sensitivity and to indicate the most suitable areas for the proposed development.

A survey was conducted during November 2022 to identify specific fauna habitats, and to compare these habitats with habitat preferences of the different fauna groups (birds, mammals, reptiles, amphibians) occurring in the quarter degree grid.

The sensitivity of the solar park footprint varies between low – medium. Most of the power line route is also classified as low-medium except where the powerline will cross drainage channels and pans. The proposed development should avoid sensitive areas such as wetlands and riverine areas, while also allowing corridors of indigenous grassland on areas outside the development footprint to be preserved. Where sensitive areas of natural vegetation cannot be avoided, a few mitigation measures have been recommended to minimise and/or offset impacts (licence application for removal of protected species.). Negative impacts can be minimised by strict enforcement and compliance with an Environmental Management Programme (EMPr) which considers recommendations for managing impacts detailed above.

According to the Ecological Specialist, provided that the proposed development and layout plans is consistent with the sensitivity map and take all mitigation measures into consideration, the planned development can be supported.

Impacts on Aquatic Ecology

Vegetation associated with water courses and wetlands has a high sensitivity with a high conservation priority. No major alteration of drainage areas is recommended, especially considering it to form part of an important catchment. The potential to impact on the habitat is high and therefore a sufficient buffer zone of 32m is applicable for the development site or the flood line zone.

All construction and maintenance activities should be conducted in such a way that minimal damage is caused to drainage features on site.

No development can be done within the flood line zone without a Water Use Licence, except if outside the 1:100-year flood line or 100 meters from the delineated riverine areas or 500 meters from wetlands.

Impacts on Avifauna

An Avifaunal Assessment was conducted to determine whether the proposed development would have negative impact on avifauna.

One hundred and twenty-nine (129) bird species were recorded in and around the project area of influence, with 95 species recorded from point counts and an additional 34 species recorded as incidental sightings. The field survey was conducted on 12 -15 December 2022.

The assessment area consisted of four avifauna habitats; transformed areas, degraded grassland, grassland and bushclumps. These habitats are still mainly in a natural state except for areas disturbed by livestock grazing and transformed due to anthropogenic activities. Three species of conservation concern were confirmed in the assessment area (Blue Korhaan (*Eupodotis caerulescens*), Lanner Falcon (*Falco biarmicus*) and Secretarybird (*Sagittarius serpentarius*). Some high-risk avifauna species were recorded in the project area and surrounds, including raptors and water birds.

Based on the high receptor resilience and medium biodiversity importance, the assessment area was given low site ecological importance, with transformed areas having a very low site ecological importance (SEI).

The development will also lead to sensory disturbance, collision and electrocution risks. Even though the latter three impacts can be effectively mitigated, the loss of habitat cannot be mitigated. Considering the number of applications and current solar plant developments in the area the cumulative impact is regarded as being high.

Very few sensitive features were identified for the project along the proposed power line. It is the opinion of the specialist that the project may be considered for approval, but all prescribed mitigation measures and monitoring must be considered by the issuing authority. Bird diverters, guards, and spirals must be placed along the proposed powerline to reduce fatalities, as large terrestrial birds and raptors occur across the entire proposed powerline. Any power lines to be developed must be extensively mitigated.

Visual Impacts

A Visual Impact Assessment (Annexure J) was conducted by Mitha Cilliers an independent visual Specialist to determine visual impact of the proposed solar park and power lines.

The main characteristics of the study area includes mining, crop, and livestock farming. Tourist attractions mostly occur on the outer edges of the study area, 20km radius, with the closets being the Allemanskraal Dam, approximately 16km South-East of the nearest solar park site, on the outer edge of the visual analysis.

The residential component of the study area includes farmstead with associated workers housing as well as the towns of Virginia and Ventersurg and the townships of Meloding and Mmamahabane.

Visually Sensitive Receptors within the study area with a high sensitivity comprised of residential type receptors including: farmsteads with associated residences, the town of Virginia and the township of Meloding, agricultural holdings, clusters of residences and other small communities; tourist attractions including game farms, of which the Willem Pretorius game reserve is the largest, guest houses and events locations as well as historical landmarks including the Sandrivier Convention Memorial Stone as well as the N1 National road due to its prominence as a national road linking the Southernmost tip of Africa to the rest of the continent.

The generalized **Relevance** of the visual impact on these receptors were as follows:

- **Residential: *marginal***
- **Transport: *marginal***
- **Business / Occupational / Industrial: *marginal***
- **Open Space Users / Recreational: *marginal***

VSRs with the largest anticipated impact include the residences on the farm Welgelegen No. 382, located just over 400m and approximately 3,2km to the southwest of the proposed new layout of the Florida power line. For the nearest farmstead the visual impact relevance of the impact would be substantial. Views would however include the existing power line, located just over 550m from the viewer, which would form part of the backdrop of the view. Existing buildings and vegetation would partially screen the proposed project components from the viewer. The anticipated impact has been mitigated by using one instead of the originally proposed four power lines. The newly proposed Florida 400kV substation is located approximately 2,0km, 2,7km, and 4,0km from the farmsteads on the farm Welgelegen, the substation would be located in the background of views from these key viewpoints and include views of various existing power lines.

The proposed Florida Solar Park & Power Line would have a **medium significance** for all visual receptors, during all phases of the project, with or without the correct and effective implementation of the proposed mitigation measures except when mitigation

measures are implemented correctly and effectively in the decommissioning phase, then the rating would drop to **low-medium**. This is due to the duration and frequency of the exposure to the impact, i.e., where there are views of the proposed project components, they will 'always' be visible for the duration of the project lifetime.

Socio-economic Impacts

The socio-economic impact of the proposed Florida Solar Project is considered positive, and the application is supported, provided that all the mitigation measures proposed by specialist consultants are implemented.

The project is consistent with development policies at the national, provincial, and local government levels, although the institutional readiness for a project of this nature will have to be carefully managed at the municipal level.

Impacts on Land Use, Soil and Agricultural Potential

Based on Part 1 of the Regulation of the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the proposed development area, can be classified as having Moderate potential soils for dry land croplands.

The nature of the vegetation at the farm is also moderate for extensive livestock production.

Impacts on Heritage Resources

Four Historical Heritage sites (FSP-CP01, FSP-CP02, FSP-HP01 & FSP-HP02) occur within the proposed Florida Solar Park Project and powerline corridor and impact on the sites is likely. However, sites CP01 & CP02 have NO heritage significance and sites HP01 & HP02 have low heritage significance. NO human burials were located.

Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological, or historical material, or burials be exposed during construction activities, all activities should be suspended, and the archaeological specialist should be notified immediately.

According to the Palaeontological Impact report there were no rocky outcrops, and NO FOSSILS present on the land surface on the Solar PV site. Given the lack of surface outcrop, there is only a very small chance that there is outcrop in the soils below the surface. A Fossil Chance Find Protocol will be added to the EMP. It is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, developer, environmental officer or other designated responsible person once excavations or drilling activities have commenced. The impact will be low to moderate, as far as the palaeontology is concerned, and the project may be authorised.

According to the Palaeontological Impact report, based on the fossil record for the powerline area and confirmed by a site visit and walk through there are no rocky outcrops and NO FOSSILS of the Daptocephalus Assemblage Zone (Adelaide Subgroup, Beaufort Group, Karoo Supergroup).

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 below the ground surface in the shales of the Adelaide Subgroup so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the contractor, environmental officer, or other responsible person, once excavations or drilling for pole foundations have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample. Since the impact will be low to moderate, as far as the palaeontology is concerned, the project should be authorised.

Impacts on Civil Aviation

Evidence from the assessment and the technical drawings show clearly that the Florida Project will not interfere or impact the Obstacle Limit Surfaces and Approach/Departure Surfaces of Harmony Mine and Beatrix Mine airports.

Impacts on Traffic

- The road network-related impact from a road capacity perspective due to the Proposed Florida Solar Park would have a low significance due to a low volume of vehicles along Road R73 as determined by the relevant 12-hour manual traffic counts and that no road capacity-related mitigating measures would be required.
- The road network-related impact from a road safety perspective in terms of intersection spacing would have a medium significance if not mitigated due to the presence of existing farm access intersections within the vicinity of the Proposed Florida Solar Park.
- In order to adhere to the required intersection spacing (1.6km for a rural class 3 road), the existing Eastern Farm Access Road which intersects with Road R73 at Point 2 (Point A-2) would need to be relocated to Point A and the existing Southern Farm Access Road which intersects with Road R73 at Point 4 would need to be relocated to Point C. With the implementation (mitigation) of the required intersection spacing, a low significance in terms of intersection spacing would be relevant.
- The road network-related impact from a road safety perspective in terms of intersection sight distances due to the Proposed Florida Solar Park access intersections (Points A, B, and C) would have a low significance due to the required intersection sight distances being sufficient at the proposed access intersections and no mitigating measures would be required.
- The road network-related impact from a road safety perspective in terms of the speed limit along Road R73 would have a low significance on the Proposed Florida

Solar Park and no road safety-related mitigating measures in terms of the speed limit would be required.

- The road network-related impact from a road safety perspective in terms of the need for dedicated right-turn and left-turn lanes along Road R73 as part of the Proposed Florida Solar Park access intersection (Point B) would have a medium-high significance due to a potential increase in collisions (rear-end which could lead to fatalities), specifically, vehicles waiting within the main traffic flow lane of Road R73 to turn right into the Proposed Florida Solar Park if a dedicated right-turn lane on the northern approach of Road R73 at Point B is not provided. With the provision of the above-mentioned at the proposed access intersection (Point B), the impact from a road safety perspective in terms of the need for dedicated turning lanes would have a low significance.
- The road network-related impact from a road safety perspective in terms of pedestrian movements with the proposed access intersections (Points A, B, and C) due to the Proposed Florida Solar Park would have a low significance as no pedestrian activity is expected along Road R73 due to the rural locality of the Proposed Florida Solar Park and limited public transport availability, and that no road safety-related mitigating measures in terms of pedestrian movement would be required.
- The road network-related impact from a road safety perspective in terms of loading and off-loading of workers, specifically during the construction phase, as part of the Proposed Florida Solar Park would have a medium-high significance if a dedicated loading and off-loading area is not provided on site as part of the Proposed Florida Solar Park and workers are loaded and off-loaded within the road reserve of Road R73. With the provision of a dedicated loading and off-loading area on site as part of the Proposed Florida Solar Park and ensuring that contractors make use of the dedicated area, the impact from a road safety perspective in terms of loading and off-loading workers would have a low significance.

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ABBREVIATIONS AND ACRONYMS

AGES	Africa Geo-Environmental and Engineering Services (Pty) Ltd
BID	Background Information Document
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CSP	Concentrating Solar Power
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE	National Department of Forestry, Fisheries and Environment,
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environment Impact Assessment Report
EMPr	Environmental Management Programme
ESS	Environmental Scoping Study
GHG	Green House Gases
GIS	Geographic Information Systems
GN	Government Notice
GWh	Giga Watt hour
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IPP	Independent Power Producer
kV	kilovolt
MW	Mega Watt
MWp	Mega Watt peak
NEMA	National Environmental Management Act - Act no. 107 of 1998
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act - Act no. 25 of 1999
NWA	National Water Act - Act no. 36 of 1998
PoS	Plan of Study
PV	Photovoltaic
RFP	Request for Qualification and Proposals for New Generation Capacity under the IPP Procurement Programme
REIPPPP	Renewable Energy IPP Procurement Programme
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
UPS	Uninterruptible Power Supply
Piscis Energy	Piscis Energy (Pty) Ltd (applicant)

1 OBJECTIVE OF THE EIA PROCESS

According to the EIA Regulations 2017, Regulation No R 326 of 07 April 2017, Appendix 3, Section 2, the objective of the EIA process is to, through a consultative process —

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
- (c) identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- (g) identify suitable measures to avoid, manage or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name of EAP: AGES Limpopo – Anton von Well

Contact details of EAP:

Physical Address: 120 Marshall Street,
Polokwane, 0699

Telephone number: 015 291 1577

Fax number: 087 940 0516

Expertise of EAP: The EAP is registered as an Environmental Assessment Practitioner at EAPASA and has 22 years of experience with management and conducting of EIA’s. Curriculum Vitae of EAP is included in Annexure S.

3 LOCATION OF ACTIVITY

3.1 SURVEYOR GENERAL 21 DIGIT CODES OF PV DEVELOPMENT AREA

Table 1. Site location - Surveyor-general 21-digit site code:

F	0	3	5	0	0	0	0	0	0	0	0	0	6	3	3	0	0	0	0	1
F	0	3	5	0	0	0	0	0	0	0	0	0	6	3	3	0	0	0	0	4
F	0	3	5	0	0	0	0	0	0	0	0	0	7	6	6	0	0	0	0	0
F	0	3	5	0	0	0	0	0	0	0	0	0	7	0	8	0	0	0	0	0
1	2		3			4						5								

3.2 PHYSICAL ADDRESS AND FARM NAME

PISCIS ENERGY (PTY) LTD is proposing the establishment of a **renewable energy generation facility (Photovoltaic Power Plant)** with associated infrastructure and structures on:

- Portion 1 of the Farm FLORIDA 633, Ventersburg RD (579 ha);
- Portion 4 of the Farm FLORIDA 633, Ventersburg RD (709 ha);
- Remainder of the Farm LE ROUX 766, Ventersburg RD (451 ha);
- Remainder of the Farm KRIEGERS KRAAL 708, Ventersburg RD (708 ha);

located within the Matjhabeng Local Municipality, Lejweleputswa District Municipality, Free State Province.

The name of the facility will be **FLORIDA SOLAR PARK**.

The **footprint (fenced area)** of proposed PV development is approximately **365 ha in extent**.

The **Florida 132kV power line** will traverse the following properties, according to the proposed powerline alignment, within the Powerline Study Corridor:

- Portion 1 of the Farm Florida 633, Ventersburg RD (project site);
- Portion 4 of the Farm Florida 633, Ventersburg RD (project site).

The new **Florida 132/400kV substation and 400kV switching station** is planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD**, within the Powerline Study Corridor.

Table 2. Properties crossed by Florida 132kV Powerline – SG 21-digit site code:

F	0	3	5	0	0	0	0	0	0	0	0	0	6	3	3	0	0	0	0	1
F	0	3	5	0	0	0	0	0	0	0	0	0	6	3	3	0	0	0	0	4
1	2			3				4					5							

The **Florida 400kV power line** will traverse the following properties, according to the proposed powerline alignment, within the Powerline Study Corridor:

- Portion 1 of the Farm Florida 633, Ventersburg RD (project site);
- Portions 2 (Remaining Extent), 22 (Remaining Extent) and 24 of the Farm Welgelegen 382, Theunissen RD;
- Remainder, Portion 2 (Remaining Extent), Portions 3 and 8 of the Farm Bloemhoek 509, Theunissen RD;
- Portions 11 and 21 (both unregistered from the Remainder) of the Farm Doorn River 330, Theunissen RD;
- Portion 6 of the Farm Doorn River 330, Theunissen RD (Eskom Theseus substation);

located within the Matjhabeng and Masilonyana Local Municipalities, Lejweleputswa District Municipality, Free State Province.

Table 3. Properties crossed by Florida 400kV Powerline – SG 21-digit site code:

F	0	3	5	0	0	0	0	0	0	0	0	0	6	3	3	0	0	0	0	1
F	0	3	3	0	0	0	0	0	0	0	0	0	3	8	2	0	0	0	0	2
F	0	3	3	0	0	0	0	0	0	0	0	0	3	8	2	0	0	0	2	2
F	0	3	3	0	0	0	0	0	0	0	0	0	3	8	2	0	0	0	2	4
F	0	3	3	0	0	0	0	0	0	0	0	0	5	0	9	0	0	0	0	0
F	0	3	3	0	0	0	0	0	0	0	0	0	5	0	9	0	0	0	0	2
F	0	3	3	0	0	0	0	0	0	0	0	0	5	0	9	0	0	0	0	3
F	0	3	3	0	0	0	0	0	0	0	0	0	5	0	9	0	0	0	0	8
F	0	3	3	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
F	0	3	3	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	1
F	0	3	3	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	2	1
1	2			3				4					5							
* Unregistered farm portions (subdivision not registered yet)																				

Table 4. Geographical coordinates of the Florida PV plant footprint Area numbers indicated in figure 1 below.

Area 1		
Point	Longitude	Latitude
P1	26° 54' 20.39" E	28° 10' 07.50" S
P2	26° 54' 19.35" E	28° 10' 12.60" S
P3	26° 54' 19.14" E	28° 10' 23.18" S
P4	26° 54' 37.05" E	28° 10' 21.42" S
P5	26° 54' 49.47" E	28° 10' 20.50" S
P6	26° 54' 48.83" E	28° 10' 12.14" S
Extent: 29.8 ha		

Area 4		
Point	Longitude	Latitude
P1	26° 55' 27.69" E	28° 11' 46.46" S
P2	26° 55' 36.93" E	28° 12' 01.46" S
P3	26° 55' 38.73" E	28° 12' 17.30" S
P4	26° 55' 37.95" E	28° 12' 17.56" S
P5	26° 55' 34.32" E	28° 12' 17.06" S
P6	26° 55' 32.10" E	28° 12' 17.14" S
P7	26° 55' 31.51" E	28° 12' 16.98" S
P8	26° 55' 10.36" E	28° 11' 54.99" S
P9	26° 55' 16.07" E	28° 11' 55.53" S
P10	26° 55' 16.05" E	28° 11' 56.59" S
P11	26° 55' 18.13" E	28° 11' 56.87" S
P12	26° 55' 19.65" E	28° 11' 53.67" S
P13	26° 55' 23.64" E	28° 11' 53.41" S
P14	26° 55' 24.47" E	28° 11' 49.32" S
P15	26° 55' 26.62" E	28° 11' 46.95" S
Extent: 33.8 ha		

Area 5		
Point	Longitude	Latitude
P1	26° 54' 59.32" E	28° 12' 12.38" S
P2	26° 55' 09.86" E	28° 11' 55.90" S
P3	26° 55' 29.77" E	28° 12' 16.50" S
P4	26° 55' 26.52" E	28° 12' 15.75" S
P5	26° 55' 22.17" E	28° 12' 15.09" S
P6	26° 55' 18.88" E	28° 12' 15.75" S
P7	26° 55' 12.44" E	28° 12' 16.53" S
P8	26° 55' 06.81" E	28° 12' 16.62" S
P9	26° 55' 04.05" E	28° 12' 16.75" S
Extent: 26.4 ha		

Area 6		
Point	Longitude	Latitude
P1	26° 55' 11.43" E	28° 12' 23.54" S

Area 2		
Point	Longitude	Latitude
P1	26° 55' 08.28" E	28° 10' 32.95" S
P2	26° 55' 08.89" E	28° 10' 43.36" S
P3	26° 55' 24.50" E	28° 11' 34.40" S
P4	26° 55' 22.00" E	28° 11' 38.46" S
P5	26° 55' 20.36" E	28° 11' 38.61" S
P6	26° 55' 18.83" E	28° 11' 38.61" S
P7	26° 55' 19.61" E	28° 11' 37.03" S
P8	26° 55' 19.86" E	28° 11' 35.88" S
P9	26° 55' 19.59" E	28° 11' 34.44" S
P10	26° 55' 19.15" E	28° 11' 33.69" S
P11	26° 55' 17.18" E	28° 11' 32.84" S
P12	26° 55' 15.08" E	28° 11' 32.60" S
P13	26° 55' 13.36" E	28° 11' 32.82" S
P14	26° 55' 12.48" E	28° 11' 33.12" S
P15	26° 55' 11.62" E	28° 11' 33.54" S
P16	26° 55' 10.93" E	28° 11' 33.98" S
P17	26° 55' 09.43" E	28° 11' 34.88" S
P18	26° 55' 07.68" E	28° 11' 36.23" S
P19	26° 55' 05.52" E	28° 11' 38.44" S
P20	26° 55' 03.73" E	28° 11' 39.70" S
P21	26° 55' 03.55" E	28° 11' 39.90" S
P22	26° 55' 03.44" E	28° 11' 40.24" S
P23	26° 54' 59.96" E	28° 11' 42.31" S
P24	26° 54' 59.23" E	28° 11' 40.84" S
P25	26° 54' 58.48" E	28° 11' 39.07" S
P26	26° 54' 58.02" E	28° 11' 37.56" S
P27	26° 54' 57.55" E	28° 11' 35.61" S
P28	26° 54' 57.19" E	28° 11' 33.35" S
P29	26° 54' 56.85" E	28° 11' 29.58" S
P30	26° 54' 54.65" E	28° 11' 02.45" S
P31	26° 54' 52.52" E	28° 10' 36.70" S
P32	26° 54' 52.46" E	28° 10' 35.94" S
P33	26° 54' 51.98" E	28° 10' 29.98" S
P34	26° 54' 50.58" E	28° 10' 12.43" S
P35	26° 55' 07.23" E	28° 10' 15.15" S
P36	26° 55' 08.24" E	28° 10' 32.34" S
Extent: 137.1 ha		

Area 3		
Point	Longitude	Latitude
P1	26° 55' 07.61" E	28° 11' 55.09" S
P2	26° 55' 08.54" E	28° 11' 55.99" S
P3	26° 54' 58.67" E	28° 12' 11.42" S

P2	26° 55' 12.71" E	28° 12' 23.01" S
P3	26° 55' 17.66" E	28° 12' 22.30" S
P4	26° 55' 20.05" E	28° 12' 21.36" S
P5	26° 55' 24.88" E	28° 12' 21.36" S
P6	26° 55' 27.18" E	28° 12' 20.95" S
P7	26° 55' 29.19" E	28° 12' 21.53" S
P8	26° 55' 32.08" E	28° 12' 21.53" S
P9	26° 55' 34.47" E	28° 12' 22.05" S
P10	26° 55' 34.88" E	28° 12' 22.11" S
P11	26° 55' 43.33" E	28° 12' 30.71" S
P12	26° 55' 43.22" E	28° 12' 34.88" S
P13	26° 55' 25.60" E	28° 12' 36.61" S
Extent: 27.2 ha		

P4	26° 54' 56.51" E	28° 12' 08.98" S
P5	26° 54' 55.87" E	28° 12' 09.00" S
P6	26° 54' 36.70" E	28° 11' 51.84" S
P7	26° 54' 39.02" E	28° 11' 28.02" S
P8	26° 54' 30.09" E	28° 11' 27.09" S
P9	26° 54' 24.83" E	28° 11' 03.42" S
P10	26° 54' 34.07" E	28° 11' 04.58" S
P11	26° 54' 53.84" E	28° 11' 14.37" S
P12	26° 54' 55.42" E	28° 11' 33.30" S
P13	26° 54' 55.67" E	28° 11' 36.18" S
P14	26° 54' 56.06" E	28° 11' 38.71" S
P15	26° 54' 57.34" E	28° 11' 41.59" S
P16	26° 54' 58.34" E	28° 11' 43.26" S
P17	26° 54' 58.04" E	28° 11' 43.45" S
P18	26° 54' 57.23" E	28° 11' 43.62" S
P19	26° 54' 56.00" E	28° 11' 44.90" S
P20	26° 54' 55.83" E	28° 11' 46.54" S
P21	26° 54' 56.41" E	28° 11' 47.37" S
P22	26° 54' 57.65" E	28° 11' 48.10" S
P23	26° 54' 59.42" E	28° 11' 48.10" S
P24	26° 55' 00.96" E	28° 11' 47.53" S
P25	26° 55' 04.69" E	28° 11' 51.92" S
P26	26° 55' 05.28" E	28° 11' 51.65" S
P27	26° 55' 08.05" E	28° 11' 54.47" S
Extent: 110.0 ha		

Table 5. Geographical coordinates of Florida BESS and construction camp

Florida BESS		
Point	Longitude	Latitude
P01	26° 54' 31.59" E	28° 11' 09.17" S
P02	26° 54' 26.61" E	28° 11' 08.57" S
P03	26° 54' 28.31" E	28° 11' 16.23" S
P04	26° 54' 53.37" E	28° 11' 16.25" S
P05	26° 54' 53.24" E	28° 11' 14.71" S
P06	26° 54' 33.87" E	28° 11' 05.11" S
P07	26° 54' 32.27" E	28° 11' 04.90" S
Overall footprint		15 ha

Table 6. Geographical coordinates of the Florida 132kV on-site substation

Florida On-site substation and 132kV switching station		
Point	Longitude	Latitude
P01	26° 54' 26.99" E	28° 11' 04.20" S
P02	26° 54' 26.54" E	28° 11' 07.00" S
P03	26° 54' 31.10" E	28° 11' 07.57" S
P04	26° 54' 31.55" E	28° 11' 04.77" S
Overall footprint		1.12 ha

Table 7. Geographical coordinates of the new Florida 132kV/400kV substation and 400kV switching station

Florida 132kV/400kV substation and 400kV switching station		
Point	Longitude	Latitude
P1	26° 52' 48.79" E	28° 10' 32.08" S
P2	26° 52' 44.81" E	28° 10' 32.48" S
P3	26° 52' 43.96" E	28° 10' 25.83" S
P4	26° 52' 47.95" E	28° 10' 25.43" S
Overall footprint		2.25 ha

Table 8. Geographical coordinates of the Florida 132kV powerline

Florida 132 kV Powerline		
Point	Longitude	Latitude
P01 Florida On-site substation	26° 54' 26.88" E	28° 11' 05.91" S
P02	26° 54' 23.38" E	28° 11' 05.48" S
P03	26° 54' 14.82" E	28° 11' 00.81" S
P04	26° 52' 47.49" E	28° 10' 49.91" S
P05	26° 52' 45.52" E	28° 10' 34.92" S
P06	26° 52' 45.89" E	28° 10' 33.58" S
P07 Florida 132kV/400kV substation	26° 52' 45.70" E	28° 10' 32.08" S
Overall length		3.3 km

Table 9. Geographical coordinates of the Florida 400kV powerline

Florida 400 kV Powerline		
Point	Longitude	Latitude
P01 Florida 132kV/400kV substation	26° 52' 46.72" E	28° 10' 26.16" S
P02	26° 52' 46.03" E	28° 10' 20.06" S
P03	26° 52' 31.30" E	28° 10' 10.78" S
P04	26° 51' 11.19" E	28° 09' 51.08" S
P05	26° 51' 07.13" E	28° 09' 51.38" S
P06	26° 50' 04.29" E	28° 09' 35.87" S
P07	26° 49' 48.62" E	28° 09' 49.23" S
P08	26° 49' 42.93" E	28° 09' 48.66" S
P09 Eskom Theseus Substation	26° 49' 45.76" E	28° 09' 38.98" S
Overall length		5.9 km

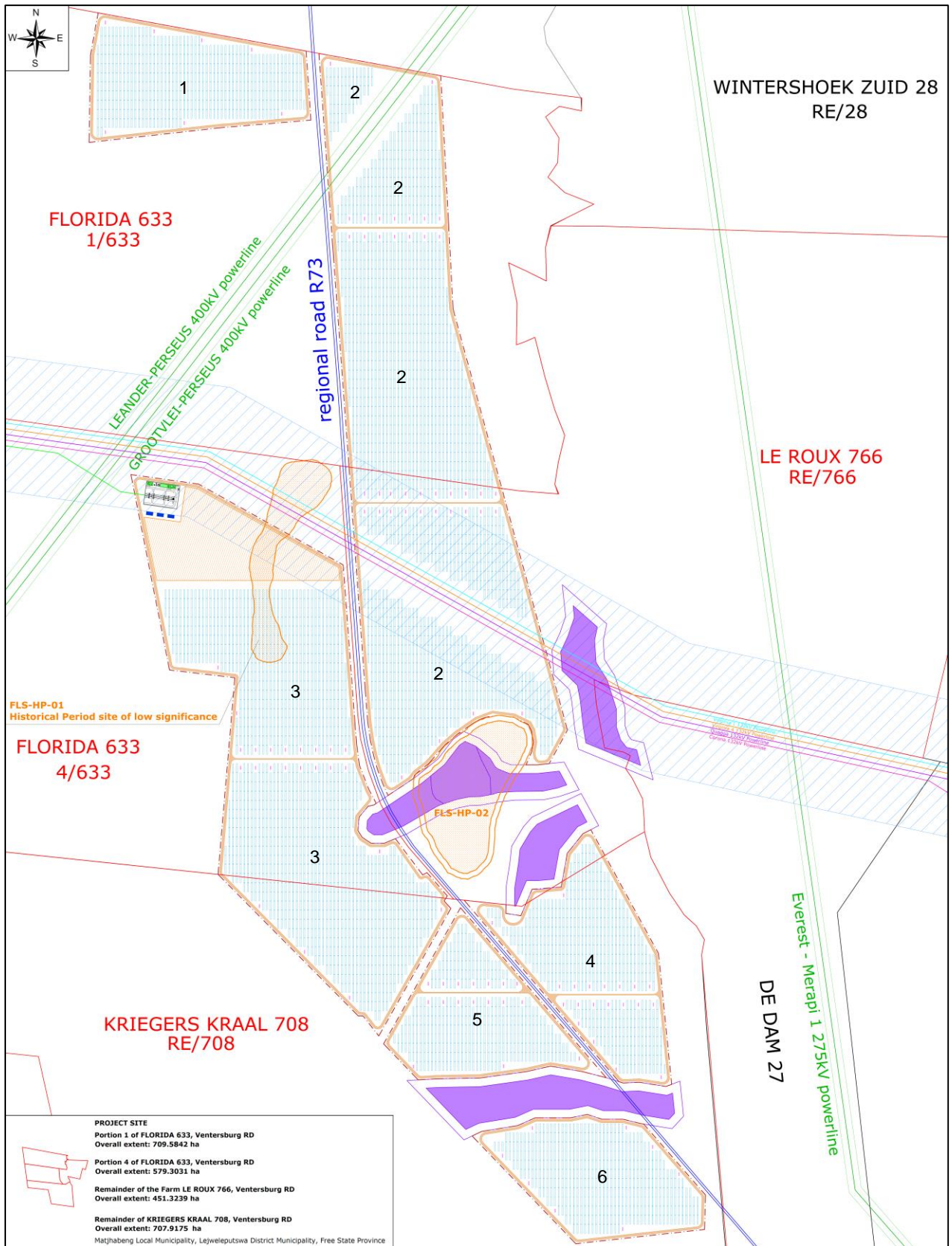


Figure 1. Proposed Layout Plan of the Florida Solar PV facility

Access to the Florida Solar Park will be from the **R73 regional road** from the N1, North-East of Winburg, in the direction of Virginia. This road traverses the Florida project site from north to south.

In order to develop the facility, Piscis Energy must undertake an Environmental Impact Assessment (EIA) process and acquire environmental authorization from the *National Department of Forestry, Fisheries and the Environment (DFFE)*, in consultation with the *Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)*, in terms of the EIA Regulations, 2014 published on 4 December 2014, as amended under section 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

Piscis Energy is the applicant for Florida Solar Park (the proposed project) which will be connected to a **new 132kV/400kV substation and 400kV switching station** (the “**Florida 132kV/400kV Substation**”), through a new 132 kV powerline **3.3 km long** (the “**Florida 132 kV Powerline**”).

The Florida 132kV/400kV Substation is planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD**, and will be connected to **Eskom Theseus Main Transmission Substation (MTS)** through a new 400 kV powerline 5.9 km long (the “**Florida 400 kV Powerline**”).

This Florida 132kV/400kV Substation and the Florida 400 kV Powerline will be shared by several projects (*i.e.* the Florida, Corona, Quagga and Virginia 4 Solar Parks), but the applicant in terms of the environmental process is **Piscis Energy (Pty) Ltd**. Once built, this shared 400kV connection infrastructure will be owned and operated by **Eskom**.

The **Eskom Theseus Main Transmission Substation (MTS)** is located 8.4 km West of the north-western corner of project site.

The independent Environmental Assessment Practitioners (EAPs) which have been appointed by Piscis Energy for the undertaking of the detailed environmental studies in compliance with the 2014 EIA Regulations, as amended, are AGES Limpopo (Pty) Ltd (**AGES**).

With the aim of identifying and assessing all potential environmental impacts related to the development as well as suggesting possible mitigation measures and alternatives, AGES has appointed specialist sub-consultants to compile detailed reports and to study the activities necessary for the assessment of the specific impacts related to their field of expertise.

AGES and the other specialist consultants are in a position of independency from Piscis Energy and not subsidiaries or affiliated to the latter. AGES and the specialist consultants have no secondary interest connected with the development of this project or of other projects which may originate from the authorization of the project.

The characteristics, the technology and the extent of the Florida Solar Park is defined and evaluated in this EIA Report and its annexures.

4 LOCALITY MAP OF THE PROPOSED ACTIVITY

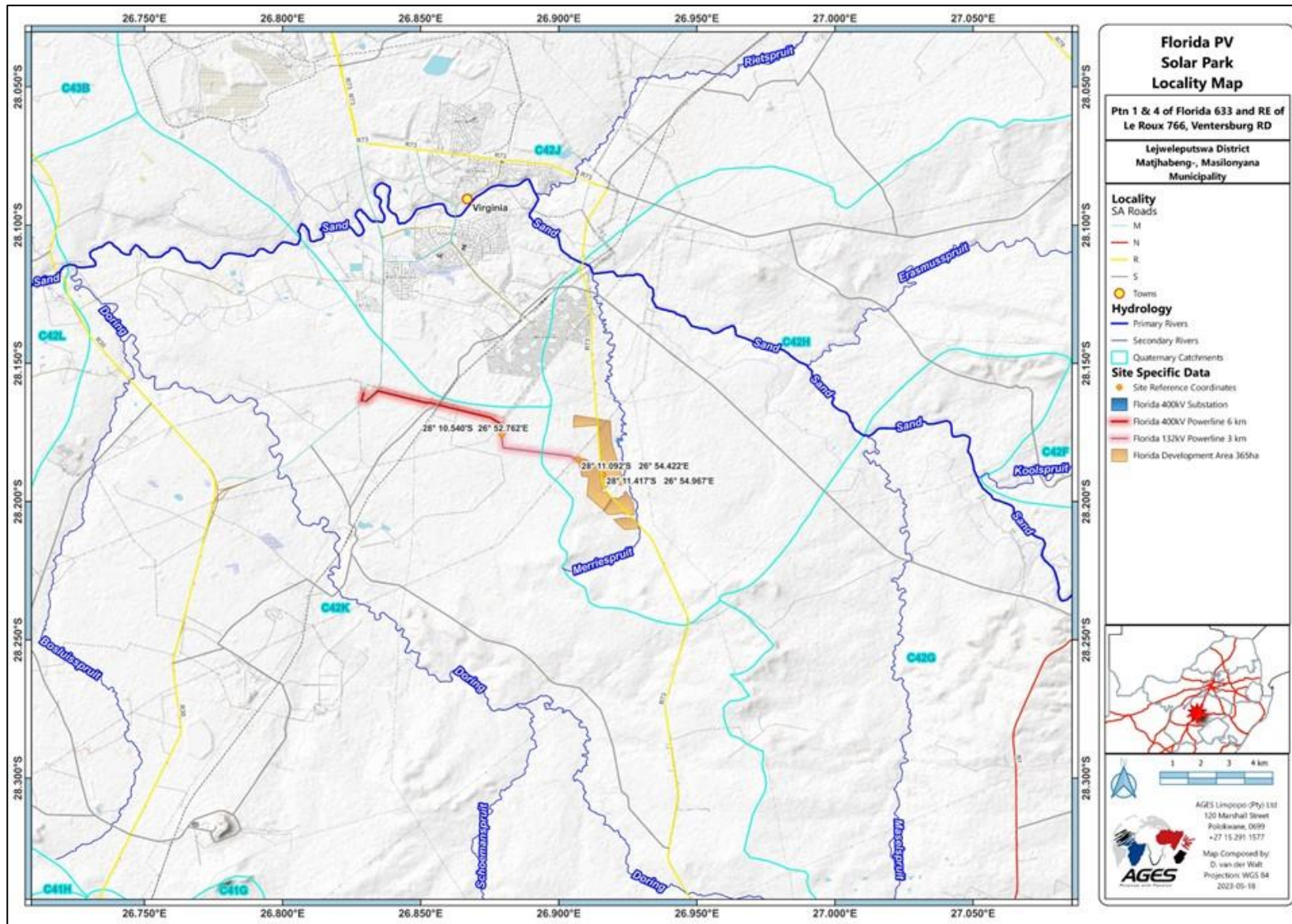


Figure 2. Locality map

5 SCOPE OF THE PROPOSED ACTIVITY

5.1 LISTED ACTIVITIES TRIGGERED IN TERMS OF NEMA

The “listed activities” in terms of sections 24 and 24D of NEMA, included in **Listing Notices 1, 2 & 3 of the EIA Regulations, 2014, as amended**, relevant to the proposed development, are detailed in the table below.

Table 10. Listed Activities in terms of EIA Regulations dated 7 April 2017 triggered by the proposed development:

Listed activity	Activity description
<p>GN R.327 Item 11 (i) The development of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p>	<p>Connection of Florida Solar Park to Eskom grid will be according to Eskom connection solution, which requires:</p> <ul style="list-style-type: none"> (i) One on-site high-voltage substation with high-voltage power transformers, stepping up voltage from 22 kV (or 33 kV) to 132 kV, and one 132 kV busbar with metering and protection devices (“switching station”). (ii) One 132 kV powerline (double circuit), approximately 3.3 km long, for connection of on-site substation to 132kV busbar of new Florida 132kV/400kV Substation, planned on Portion 1 of the Farm Florida 633, Ventersburg RD. <p>Connection infrastructure is located outside urban areas or industrial complexes.</p>
<p>GN R.327, Item 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse</p>	<p>The proposed Florida 132kV Powerline, 3.3 km long, as well as the proposed Florida 400kV Powerline, 5.9 km long, will cross wetlands and drainage channels that have been identified as per a delineation by the appointed wetland specialist. Interception of the wetlands and drainage channels will entail movement of soil with a volume of more than 10 m³, during construction phase.</p>
<p>GN R.327, Item 24 (ii) The development of - (ii) a road with a reserve wider than 13,5m, or where no reserve exists where the road is wider than 8m</p>	<p>Access to Florida Solar PV will be from the R73 regional road from the N1, North-East of Winburg, in the direction of Virginia. During construction phase, access point and some internal roads will have a reserve wider than 13.5 m to allow transportation of abnormal goods (e.g., power transformers, MV stations, etc.). The overall length of internal roads is approximately 40 000 m.</p>
<p>GN R.327, Item 28 (ii) Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 ha</p>	<p>The Florida Solar Park can be regarded as an industrial development, where the total area to be transformed (footprint) will be bigger than 1 ha (up to 365 ha). The project site is currently being used for livestock grazing and agriculture.</p>
<p>GN R.325 Item 1</p>	<p>The proposed Florida Solar PV facility consists of the construction, operation and maintenance of a</p>

<p>The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 MW or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs within an urban area.</p>	<p>Photovoltaic (PV) Power Plant with a maximum generation and storage capacity up to 170 MW at the point of connection (Maximum Export Capacity). The proposed solar photovoltaic facility, as well as the associated on-site high-voltage substation and Battery Energy Storage System (BESS), will be located on Portions 1 and 4 of the Farm FLORIDA 633, Ventersburg RD, Remainder of the Farm LE ROUX 766, Ventersburg RD and Remainder of the Farm KRIEGERS KRAAL 708, Ventersburg RD.</p>
<p>GN R.325 Item 9 The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</p>	<p>Connection of Florida Solar Park to Eskom grid will be according to Eskom connection solution, which requires:</p> <ul style="list-style-type: none"> (i) One high-voltage substation with high-voltage power transformers, stepping up voltage from 132 kV to 400 kV, a 132 kV busbar and a 400 kV busbar with metering and protection devices ("switching stations"), planned on Portion 1 of the Farm Florida 633, Ventersburg RD; (ii) One 400 kV powerline, approximately 5.9 km long, for connection between the 400 kV switching station and the Eskom Theseus substation. <p>Connection infrastructure is located outside urban areas or industrial complexes.</p>
<p>GN R.325 Item 15 The clearance of an area of 20 ha or more of indigenous vegetation</p>	<p>The construction of the Florida Solar PV facility will require clearance of indigenous vegetations for a portion of approximately 233.6 ha. Indeed, the footprint of the PV plant will be up to 365 ha, where a portion of 233.6 ha consists of indigenous vegetation and 131.4 ha consist of degraded / modified land (old fields).</p>
<p>GN R.324, Item 12 (b) (i) (ii) (iv) The clearance of an area of 300 m² or more of indigenous vegetation: (b) In Free State province: (i) Within any critically endangered or endangered ecosystem listed in terms of Section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004. (ii) Within critical biodiversity areas identified in bioregional plans. (iv) Areas within a watercourse/wetland or within 100 m from the edge of a watercourse/wetland.</p>	<p>A portion of the Florida Solar Park development area (233.6 ha), the Florida 132kV powerline (3.3 km) and the Florida 400kV powerline (5.9 km) will affect areas of indigenous vegetation, classified as an endangered ecosystem (Vaal-Vet Sandy Grasslands) in terms of section 52 of the NEMBA. A small section (103 m) of the Florida 400 kV Powerline will cross a CBA 1 area. The Florida Solar Park, Florida 132kV/300kV substation and Florida 132kV and 400kV Powerlines will be developed within 100m from the edge of wetlands.</p>

The proposed Florida 132kV Powerline, 3.3 km long, as well as the proposed Florida 400kV Powerline, 5.9 km long, will intercept wetlands and drainage channels that have been identified as per the delineation of the appointed wetland specialist. Some of the poles and pylons of the two powerlines will be constructed within 32m from these features. As such, the overall footprint of such poles and towers within the 32 m buffer of the wetlands **will not**

exceed 100 m². Therefore, **activity GN R.327, Item 12 (ii)(c)** (*i.e. The development of – (ii) infrastructure or structures with a physical footprint of 100sq.m. or more (c) within 32m of a watercourse, measured from the edge of a watercourse*) **is not applicable** and for this reason it has been removed from the listed activities applied for.

5.2 DESCRIPTION OF ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT

The project envisages the establishment of a solar power plant with a maximum generation capacity at the delivery point (Maximum Export Capacity) of **up to 170 MW**.

The construction timeframe is estimated to be approximately 18 months.

The preferred technical solutions envisage:

- **mono/polycrystalline PV modules, mono or bi-facial.**
- **fixed mounting systems or horizontal 1-axis trackers.**

The estimated annual energy production is calculated in approximately:

- **2 100 kWh/kWp/year** (load factor = 0.240), in the case of PV modules mounted on fixed mounting systems; or
- **2 450 kWh/kWp/year** (load factor = 0.280) in the case of bi-facial PV modules mounted on trackers.

Therefore, the Florida Solar Park will generate:

- **650.8 kWh per year** in the case of PV modules mounted on fixed mounting systems; or
- **557.8 GWh per year** in the case of PV modules mounted on trackers.

The Global Horizontal Irradiation of the site is 2 100 kWh/m²/year (source: <https://solargis.info/imaps/>).

The energy generated by the Florida Solar Park will reduce the quantity of pollutants and greenhouse gases emitted into the atmosphere. The reduced amount of CO₂ will be the emissions that would have been generated by a thermal power plant using fossil fuels for producing the same quantity of energy that it is produced by the Florida Solar Park.

The quantity of the avoided CO₂ is calculated as follows: the energy produced by the Florida Solar Park (up to 557.8 GWh/y or 650.8 GWh/y) is multiplied by the *Electricity Grid Emission Factor* which is 1.058 t CO₂/MWh (source: Eskom, *2021 Carbon Footprint Report*).

In the case of Florida Solar Park, the avoided CO₂ emissions are approximately 527,510 tons of CO₂ per year in the case of PV modules mounted on fixed mounting systems, or 614,961 tons of CO₂ per year in the case of PV modules mounted on trackers.

Considering that 1 kg of coal generates approximately 3.7 kWh (supposing a caloric value of 8000 kcal/kg and a coal plant efficiency of 40%), the coal saved by the Florida Solar Park will be approximately 150,760 tons of coal/year in the case of PV modules mounted on fixed mounting systems, or 175,887 tons of coal/year in the case of PV modules mounted on trackers.

The detailed description of the characteristic and functioning of the PV plant and its connection are summarised in table 8 and detailed in paragraphs 5.4 to 5.5.5 below.

Table 11. Technical details of the proposed PV facility and connecting infrastructure

Component	Description/Dimensions
Technology	Solar Photovoltaic
Capacity of the facility	Maximum Export Capacity (@ the point of connection): up to 170 MW Installed power capacity - DC side (PV modules): up to 265.63 MWp Installed power capacity - AC side (inverters): up to 212.5 MW
Height of PV structures	1.0 - 4.5 m above ground
Surface area to be covered (including associated infrastructure like roads)	Project footprint / fenced area is up to 365 ha . Surface area (within the project footprint) covered by PV modules, internal roads, MV stations, HV substation and BESS is up to 182 ha (cover ratio up to 0.5)
Area occupied by both permanent and construction laydown areas	The construction camp (temporary) will be up to 15 ha in extent, within the project footprint, and will correspond to the area used for the BESS.
Number of inverters required	Each Medium voltage station will be equipped with DC/AC inverters that convert Direct Current (DC) into Alternate Current (AC) at a low voltage (typically 600 V). There will be 70 medium voltage stations of 3.0 MW each throughout the proposed development, plus one medium voltage station of 2.5 MW. PV technology is in constant and rapid evolution, this means that the final choice of the type (e.g. central inverters or string inverters) and model of inverter can be taken at the time of the commission date, on the basis of the availability of inverters of the worldwide market and of the cost-efficiency curve. The total installed capacity of the inverters (AC side) will be up to 212.5 MWac.
Area occupied by inverter/transformer stations/substations	There will be 71 medium voltage stations throughout the proposed development. Each will have an area of approximately 30 m ² . Therefore, the combined area of the medium voltage stations will be 2130 m ² .
Control rooms	The substation and switching station will be equipped with 2 control rooms. The control rooms will have a length of 30 m and a width of 11 m. Therefore, each of the control room will have an area of 330 m ² : 660 m ² in total.
Workshops/Warehouses	Three warehouses / workshops will be constructed within close proximity to the on-site substation and switching station. The three warehouses will have an area of approximately 300 m ² each: 900 m ² in total.
On-site substation	The on-site 22kV (or 33kV)/132kV step-up substation and 132kV switching station will host two 200 MVA 22kV (or 33kV)/132kV transformers (one as spare). On-site substation and switching station occupy a footprint of approx. 11,250 m ² . This area includes the control buildings.
Additional substation outside the development area	A new 132kV/400kV substation and 400kV switching station (the "Florida 132kV/400kV Substation") is planned to be located on Portion 1 of the Farm Florida 633, Ventersburg RD. The new Florida 132kV/400kV Substation will host two 500 MVA 132kV/400kV transformers and will occupy a footprint of approx. 22,520 m ² . This area includes the control buildings.
Areas occupied by buildings	Medium-voltage stations occupy a footprint of to 2,130 m ² . On-site substation and switching station occupy a footprint of approx. 11,250 m ² . This area includes the control buildings. Workshops & Warehouses occupy a footprint of approx. 300 m ² each. In total, 3 warehouses are foreseen: 900 m ² in total. Therefore, the total area occupied by buildings (MV stations, HV substation, Workshop & Warehouse) amounts to approx. 14,280 m² (1.4 ha) .

	The Battery Energy Storage Systems (BESS) will be located in the area where the camp site will be for the purpose of the construction phase. This area will be approximately 15 ha in size.
Number of 132kV powerlines	One (1) overhead 132kV powerline (double circuit) (Florida 132 kV Powerline) ±3.3 km long , connecting on-site HV substation and switching station of Solar Park to a new 132kV/400kV substation and 400kV switching station (Florida 132kV/400kV Substation).
Number of 400kV powerlines	One (1) overhead 400kV powerline (Florida 400 kV Powerline) ±5.9 km long , connecting the new Florida 132kV/400kV Substation with the Eskom Theseus Main Transmission Substation (MTS).
Voltage of overhead powerlines	132 kV & 400 kV
Servitude of overhead powerline	Florida 132 kV Powerline: 36 m (18 m from each side of the centre line) Florida 400 kV Powerline: 47 m (23.6 m from each side of the centre line)
Height of overhead powerline	Florida 132 kV Powerline: up to 25 m above the ground level Florida 400 kV Powerline: up to 40 m above the ground level
Type of powerline structures	Florida 132 kV Powerline: Steel monopole (double circuit) Florida 400 kV Powerline: Self-supporting suspension, steel lattice tower
Battery Energy Storage System (BESS)	Battery Energy Storage System (BESS) of 170 MW / 1020 MWh (6-hour storage), with a footprint up to 15 ha within the Project footprint / fenced area
Access road	Access to the Florida Solar Park will be from the R73 regional road from the N1, North-East of Winburg, in the direction of Virginia. This road traverses the Florida project site from north to south.
Length of internal roads	Approximately 40 000 m
Width of internal roads	Up to 8.0 m, with a road reserve up to 13.5 m
Height of fencing	3.0 m
Type of fencing	Wire mesh fencing with video-surveillance system

5.3 LAYOUT OF INFRASTRUCTURE AND STRUCTURES ON SITE

The layout of the proposed development is the result of a comparative study of various layout alternatives and is defined while considering results of specialist studies conducted during the Scoping and EIA phases. The PV plant is designed and designed to minimize visual and noise impacts, to operate safely and to assure a high level of reliability, with low water consumption and the need for easy and quick maintenance and repair for ± 35 to 40 years.

The footprint (fenced area) of the Florida Solar Park will be up to 365 ha.

The main drives of the proposed layout are:

- to maximize energy production and reliability of the PV plant, by choosing proven solar technologies; mono or bi-facial mono/polycrystalline solar modules mounted on single-axis horizontal trackers (SAT) or fixed mounting systems.
- to develop the PV power plant in the southern section of the farm, avoiding high potential agricultural land and natural areas.
- to avoid the Critical Biodiversity Areas (CBAs).

A small portion of the PV Park and the entire connecting powerlines will traverse areas of indigenous vegetation, an endangered ecosystem (Vaal-Vet Sandy Grasslands) in terms of section 52 of NEMBA.

A small portion of the Florida 400 kV Powerline near the Eskom Theseus substation will be developed within an CBA 1 area.

The footprint of Florida Solar Park and portions of the 132kV & 400kV powerlines will be developed within 100m from the edge of wetlands.

The proposed layout plan (attached as Annexure A and shown in Figure 2 below) was drawn using PV modules mounted on trackers. If PV modules are mounted on fixed mounting systems, layout plans will not change, except for the orientation of PV arrays: East-West instead of North-South.

The required footprint - corresponding on the fenced area - will be the same: up to 365 ha, and maximum height of structures (PV modules and support frames) will be ± 4.5 m above ground level. Impacts and mitigation measures will remain the same. The project layout and plant components are detailed in the following drawings also attached in Annexure A:

Table 12. List of maps and drawings included as Annexure A

#	Code	Title
01	FLRSP_00_LM1_r2	Locality Map
02	FLRSP_00_LM2_r2	Development Area, Powerline Alignment and Sensitivity Map (2 maps)
03	FLRSP_00_LM3_r1	Cumulative Map
04	FLRSP_00_LM4_r1	Development Area and CBAs Map
05	FLRSP_01_r2	Layout plan – PV power plant up to 170 MW
06	FLRSP_02_r0	Mounting System, Option 1 (fixed)
07	FLRSP_03_r0	Mounting System, Option 2 (Trackers)
08	FLRSP_04_r0	Medium-Voltage Stations
09	FLRSP_05_r0	Control Building and MV receiving station
10	FLRSP_06_r0	On-site substation and switching station
11	FLRSP_07_r0	132 kV Steel monopole structure
12	FLRSP_08_r0	Warehouse (2 drawings)

13	FLRSP_09_r0	Florida 400kV substation
14	FLRSP_10_r0	400kV Tower – Eskom Specs

5.4 PRIMARY COMPONENTS

The proposed development (PV Power Plant and connection infrastructure) consists of the installation of the following equipment:

- PV modules (mono-crystalline or poly-crystalline, mono-facial or bi-facial modules)
- Mounting systems for the PV arrays (single-axis horizontal trackers or fixed structures) and related foundations
- Internal cabling and string boxes
- Medium voltage stations, hosting DC/AC inverters and LV/MV power transformers
- Medium voltage receiving station(s)
- Workshops & warehouses
- One on-site high-voltage substation with high-voltage power transformers, stepping up voltage from 22 kV (or 33 kV) to 132 kV, and one 132k V busbar with metering and protection devices (switching station).
- The **Florida 132 kV power line (double circuit)**, approximately **3.3 km long** for the connection of the on-site substation to the new “Florida 132kV/400kV Substation and 400kV Switching Station”.
- The new “**Florida 132kV/400kV Substation and 400kV Switching Station**” (shared infrastructure), planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD**, collecting the 132kV powerlines coming from Florida, Corona, Quagga and Virginia 4 Solar Parks.
- The **Florida 400 kV powerline, 5.9 km long**, connecting the new Florida 400kV Switching Station to the Eskom Theseus Main Transmission Substation.
- **Battery Energy Storage Systems (BESS)**, with a Maximum Export Capacity up to **170 MW** and up to 6-hour storage capacity of **1 020 MWh**, with a footprint of **15 ha**, next to the on-site high-voltage substation, within the PV plant footprint / fenced areas.
- Electrical system and UPS (Uninterruptible Power Supply) devices
- Lighting system
- Grounding system
- Direct access from the Regional Road R73
- Internal roads
- Fencing of the site and alarm and video-surveillance system
- Water access point, water supply pipelines, water treatment facilities
- Patented Sewage system

During the construction phase, the site may be provided with additional:

- Water access point, water supply pipelines, water treatment facilities
- Pre-fabricated buildings
- Workshops & warehouses

to be removed at the end of construction.

The connection may entail the extension of the 400 kV busbar of the Eskom Theseus MTS for the establishment of new 400 kV bus-bays, according to Eskom’s connection

requirements/solution.

5.4.1 PROJECT FUNCTIONING

Solar energy facilities using PV technology convert sun energy to generate electricity through a process known as the Photovoltaic Effect, which consists of the generation of electrons by photons of sunlight to create electrical energy.

The preferred technical solutions are:

- Mono / bi-facial mono / polycrystalline modules, mounted on:
- fixed mounting systems or mounted on horizontal 1-axis trackers, which at present represent the best performing options in terms of reliability and costs/efficiency.

PV technology is in constant and rapid evolution, and the final choice of the type of solar modules (mono-crystalline or polycrystalline, mono or bi-facial) and mounting system (fixed or tracker) can be taken at the time of the commission date, based on availability of PV modules and mounting systems, of the worldwide market and the cost-efficiency curve.

The required footprint - corresponding on the fenced area - will not exceed 365 ha, and the maximum height of the structures (PV modules and support frames) will be approximately 4.5m above the ground level. Therefore the impacts and mitigation measures will not change, regardless of the technology to be applied as described above.

PV modules will be assembled on zinc steel or aluminium frames, to form PV arrays. The metal frames that sustain PV arrays are set to the ground by fixed support poles.

A) In the case of PV modules mounted on fixed mounting systems:

Each mounting frame will host several PV modules along two or more parallel rows consisting of PV modules placed side by side, with the position of the PV arrays northwards and at an optimized tilt. The rows are mounted one on top of the other, with an overall mounting structure height up to 4.5 meters above ground level.



Figure 3. Lateral views of PV arrays mounted on fixed mounting systems



Figure 4. Frontal view of PV arrays mounted on fixed mounting systems

For further details, please refer to the figures 3 and 4 above and to the drawings included in Annexure A.

B) In the case of PV modules mounted on trackers:

Each PV array is composed of several PV modules disposed along one or more parallel rows consisting of PV modules placed side by side. Each tracker is composed of several PV arrays North-South oriented and linked by a horizontal axis, driven by a motor. The horizontal axis allows the rotation of PV arrays toward the West and East direction, to follow the daily sun path.

The maximum mounting structure height will be up to 4.5 meters above ground level.

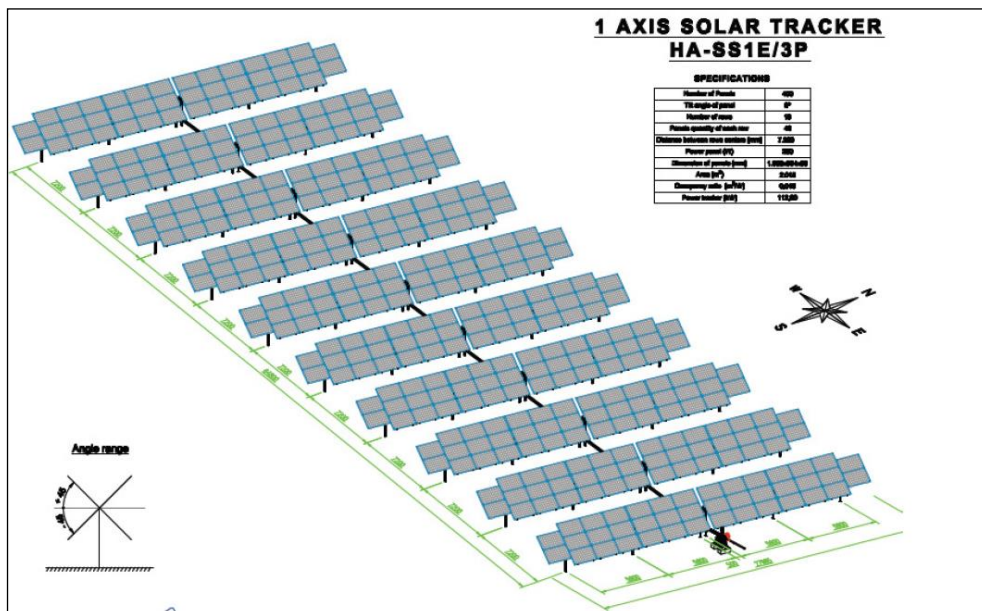


Figure 5. Simulation views of the PV arrays mounted on 1-axis horizontal tracker



Figure 6. Front views of the PV arrays mounted on horizontal 1-axis tracker

For further details, please refer to the figures 5 and 6 above and to the drawings included in Annexure A.

C) In both cases:

PV modules are series-connected outlining PV strings made of several modules, so that the PV string voltage fits into the voltage range of the inverters. PV strings are set up to be connected to DC-connection boxes. Each String Box allows the parallel connection of several PV strings (called “PV sub-field”).

String Boxes monitor the currents in photovoltaic modules and can promptly diagnose faults. String boxes are also designed with a circuit breaker to disconnect the photovoltaic sub-fields from the inverters.

The PV sub-fields are thought to be linked to central inverters, located in medium voltage stations. Each station comprises prefabricate buildings designed to host DC/AC inverters and a medium voltage power transformer. The DC/AC inverters are deemed to convert direct current (DC) into alternate current (AC) at low voltage (270 V); subsequently the AC will pass through a medium-voltage transformer to increase the voltage up to 22 kV (or 33 kV). The medium-voltage stations are detailed in the drawing in Annexure A.

The energy delivered from the medium voltage stations will be collected into one (or more) medium voltage receiving station(s), parallel connecting all the PV fields of the PV generator. From the medium voltage receiving station, the energy will be delivered to two high-voltage power transformers (200 MVA each, plus one as spare), which will step up the electric energy from the medium voltage level (22 kV or 33 kV) to 132kV. The power transformers will be connected to an on-site 132kV busbar (the so-called “switching station”), to be equipped with protection and metering devices.

New on-site HV substation will be equipped with circuit breakers upstream and downstream, to disconnect the PV power plant and/or power line in case of failure or grid problems. The layout of the on-site high-voltage substation and switching station as well as of the control building are detailed in the drawings included in Annexure A.

5.4.1.1 Florida 132 kV Powerline

Florida Solar Park will be connected to a **new 132kV/400kV substation and 400kV switching station (Florida 132kV/400kV Substation)**, through a new 132 kV powerline (double circuit) **3.3 km long (Florida 132 kV Powerline)**. The new 132 kV powerline (double circuit) will consist of a series of steel or aluminium monopole structures to be installed approximately 200–260 m apart, with supporting electrical cables. The proposed structures will be **between 18 m and 25 m** high, and the basement of each pole will have a footprint of approximately 0.6 m².

The construction phase of the Florida 132 kV Powerline will last **2 to 3 months** and will involve a team of 10-15 people. Monopole structures installation will not require the establishment of a permanent construction site, but will be done step-by-step, to affect small stretches of corridor for a short time.

An access road (dirt road), ± 4.0 m wide, may be constructed in the power line servitude, for construction and maintenance activities. At the turning points, the road reserve will be up to 14 m to allow the transportation of abnormal loads (steel monopoles).

Site preparation will consist of the clearing of a powerline servitude and vegetation removal will be done within the servitude, for the minimum width required by installation activities and by the Eskom security rules. Vegetation should not interfere with the high-voltage cables.

The Florida 132kV Powerline will traverse the following properties, according to the proposed powerline alignment, within the Powerline Study Corridor:

- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD

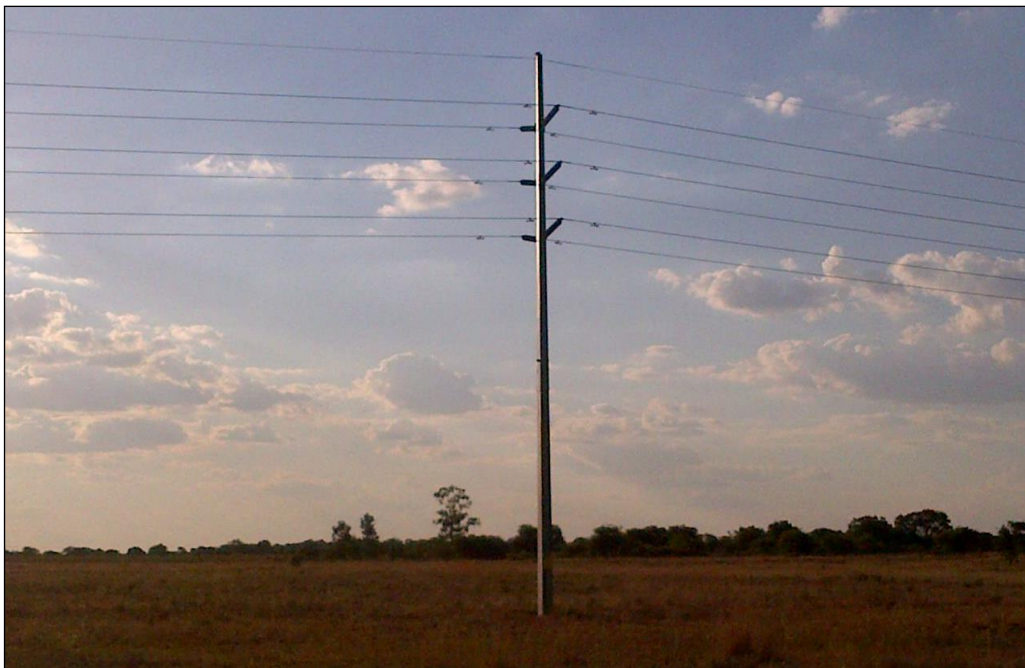


Figure 7. Steel monopole structure for a 132 kV powerline (double circuit)

5.4.1.2 Florida 132kV/400kV Substation

The **Florida 132kV/400kV Substation**, where the Florida 132 kV Powerline will be connected to, is planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD** and will be connected to the Eskom Theseus Main Transmission Substation (MTS) via a new 400 kV powerline 5.9 km long (the “**Florida 400 kV Powerline**”).

The Florida 132kV/400kV Substation will hold two step-up transformers, 500 MVA each, which will step up the electric energy from 132 kV to the required connecting voltage (*i.e.*, 400 kV). The power transformers will be connected to an on-site 400 kV busbar (the so-called “switching station”), to be equipped with protection and metering devices.

The Florida 132kV/400kV Substation will be equipped with circuit breakers upstream and downstream, to disconnect the powerlines in case of failure or grid problems. The layout of the Florida 132kV/400kV Substation is detailed in the drawings included in Annexure A.

5.4.1.3 Florida 400 kV Powerline

The Florida 132kV/400kV Substation be connected to the Eskom Theseus Main Transmission Substation (MTS) via a new 400 kV powerline 5.9 km long (the “**Florida 400 kV Powerline**”).

The construction phase of the Florida 400 kV Powerline will last **3 to 4 months** and will involve a team of 10-15 people. Self-supporting suspension, steel lattice towers installation will not require the establishment of a permanent construction site, but will be done step-by-step, to affect small stretches of corridor for a short time.

An access road (dirt road), ± 4.0 m wide, may be constructed in the power line servitude, for construction and maintenance activities. At the turning points, the road reserve will be up to 14 m to allow the transportation of abnormal loads (steel monopoles).

Site preparation will consist of the clearing of a powerline servitude and vegetation removal will be done within the servitude, for the minimum width required by installation activities and by the Eskom security rules. Vegetation should not interfere with the high-voltage cables.

The Florida 400kV Powerline will traverse the following properties, according to the proposed powerline alignment, within the Powerline Study Corridor:

- Portion 1 of the Farm Florida 633, Ventersburg RD (project site);
- Portions 2 (Remaining Extent), 22 (Remaining Extent) and 24 of the Farm Welgelegen 382, Theunissen RD;
- Remainder, Portion 2 (Remaining Extent), Portions 3 and 8 of the Farm Bloemhoek 509, Theunissen RD;
- Portions 11 and 21 (both unregistered from the Remainder) of the Farm Doorn River 330, Theunissen RD;
- Portion 6 of the Farm Doorn River 330, Theunissen RD (Eskom Theseus substation);

located within the Matjhabeng and Masilonyana Local Municipalities, Lejweleputswa District Municipality, Free State Province.

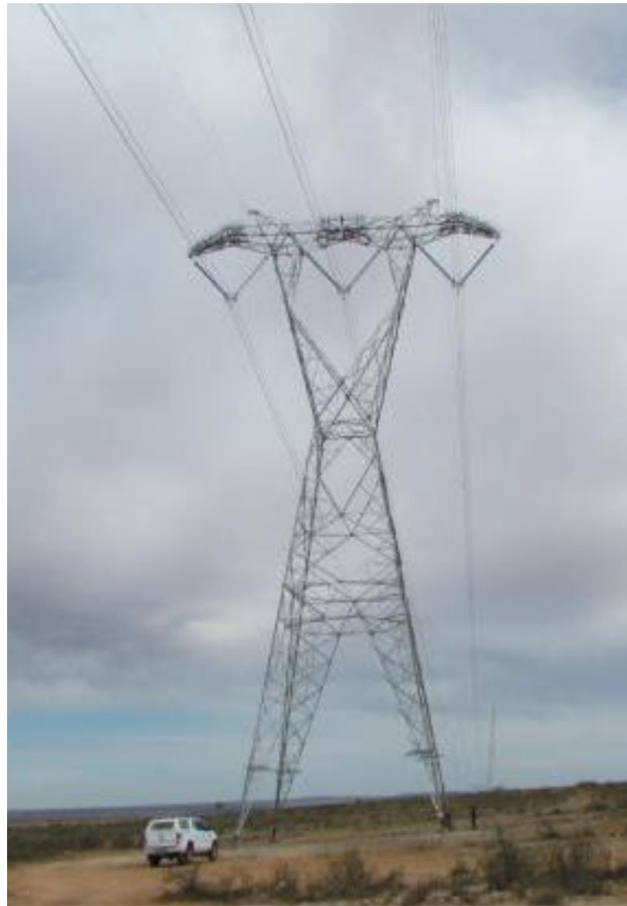


Figure 8. Self-supporting suspension tower for a 400 kV powerline

The proposed 132 kV & 400 kV powerlines and Florida 132kV/400kV Substation may be built by Piscis Energy (Pty) Ltd and/or Eskom but will be owned and operated by Eskom Distribution. This will depend on an Eskom grid code in relation to IPP's (Independent Power Producers) and Connection Agreement to be finalized prior to or simultaneously with the conclusion of a PPA (Power Purchase Agreement) regarding options for retaining ownership of the connection once built.

Florida 132 kV Powerline, 132kV/400kV Substation and 400 kV Powerline form part of the EIA process of the Florida Solar Park, applied for by Piscis Energy (Pty) Ltd. The Florida 132kV/400kV Substation and 400 kV Powerline will be shared by several projects (*i.e.* the Florida, Corona, Quagga and Florida Solar Parks), but the applicant in terms of the environmental process is **Piscis Energy (Pty) Ltd**. Once built, this shared 400kV connection infrastructure will be owned and operated by **Eskom**.

The **Eskom Theseus Main Transmission Substation (MTS)** is located 8.4 km North-East of the north-western corner of project site.

The power generation capacity at the delivery point (Maximum Export Capacity) will be up to 170 MW.

5.4.2 BATTERY ENERGY STORAGE SYSTEM (BESS)

A Battery Energy Storage System (BEES) with an output capacity up to **170 MW** and a storage capacity up to **1 020 MWh** (6-hour storage) will be installed next to an on-site step-up substation and switching station, in the footprint and fenced area of Florida PV Park.

The lithium-ion batteries will store energy at times of low energy demand and release the energy to the grid at times of peak demand. The battery energy storage system can also provide other grid services (if required by Eskom) aimed to improve grid stability and power quality, by turning on and off in fractions of a second, such as “Fast Frequency Response” (FFR).

The Battery Storage Facility will have a footprint of **up to 15 ha** and will comprise of the following equipment:

- Up to 204 containers (each up to 40m²), each with a storage capacity up to 5 MWh on a concrete platform. These will house the batteries, management system and auxiliaries.
- Up to 102 transformer stations (up to 35m² each).
- Up to an additional 10 m² per container for cooling units.
- Internal access roads up to 8.0 m wide between rows of containers.
- BESS will be connected:
 - to the PV plant by means of DC/DC inverters, and
 - to the 22 kV (or 33 kV) bus-bay of the on-site step-up substation by means of kiosk transformers, medium-voltage overhead lines and/or underground cables.

Batteries to be installed in containers will be Lithium-ion and battery cells will be pre-assembled at the supplier prior to delivery. NO electrolytes will be transported to and handled on site.

The Battery System will be able to store electrical energy and charge and discharge electrical energy when connected to a Power Conversion Unit (PCU), which performs the current conversion from LV DC to MV AC (and *vice versa*). The battery is connected at AC MV level to a Renewable Power Plant for HV conversion and grid interconnection.

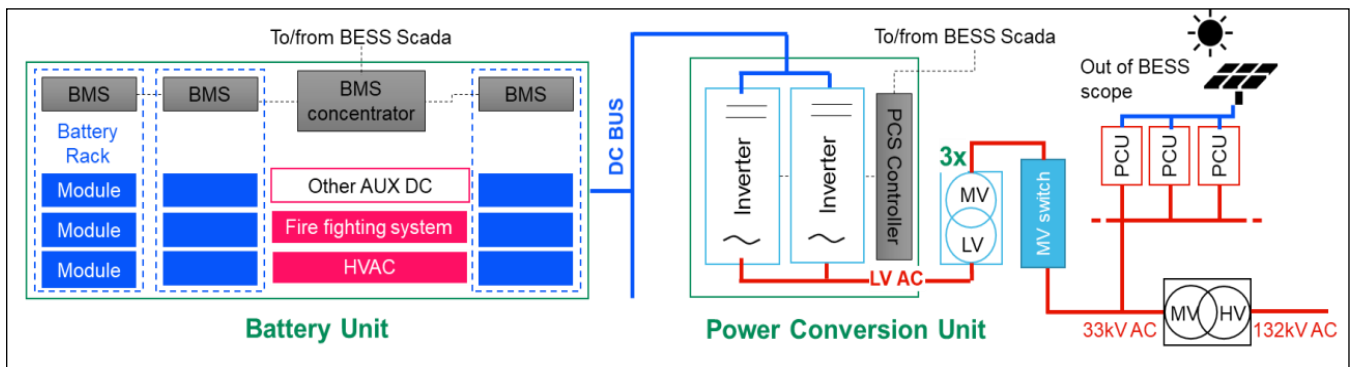




Figure 9. Battery Energy Storage System (BESS)

Battery Storage in combination to solar power plants is capable to provide multiple services to the plant and to the power transmission network adding flexibility to the system. Possible applications include amongst others: renewable generation time shifting, unbalancing reduction, curtailment avoidance, frequency regulation, voltage support, spinning reserve. A Fire Management Plan has been compiled for the BESS and PV Park and is attached to the EMPr.

5.4.3 ACCESS ROAD AND INTERNAL ROADS

Access to the Florida Solar Park will be from the **regional R73 road** running from the N1, North-East of Winburg, in the direction of Virginia. This road traverses the Florida project site from north to south and three access points are proposed (see figure 10):

- **Point A: 28°10' 36.41" S ; 26° 54' 51.44" E**
- **Point B: 28°11' 28.51" S ; 26° 54' 55.76" E**
- **Point C: 28°12' 15.00" S ; 26° 55' 29.00" E**

During construction phase, the access points from the R73 and some of the internal roads will have road reserves wider than 13.5 m (up to 16.0 m) to allow the transportation of abnormal goods like power transformers, etc.

During operation, the access point will be up to 8 m wide with a road reserve up to 13.5 m.

Internal roads will consist of gravel roads designed in accordance with engineering standards. The roads will have a width up to 8.0 m allowing for the slow-moving heavy vehicles. During construction phase, some of the internal roads will have a road reserve wider than 13.5 m (up to 16.0 m) to allow the transportation of abnormal goods (e.g. power transformers, etc.).

Once the solar farm is in operation, the internal roads will mainly be used for maintenance and inspections. The vertical alignment of the roads will not present significant challenges due to the flatness of the terrain. The entire development will be contained inside a fenced area and the roads are not intended for public use.

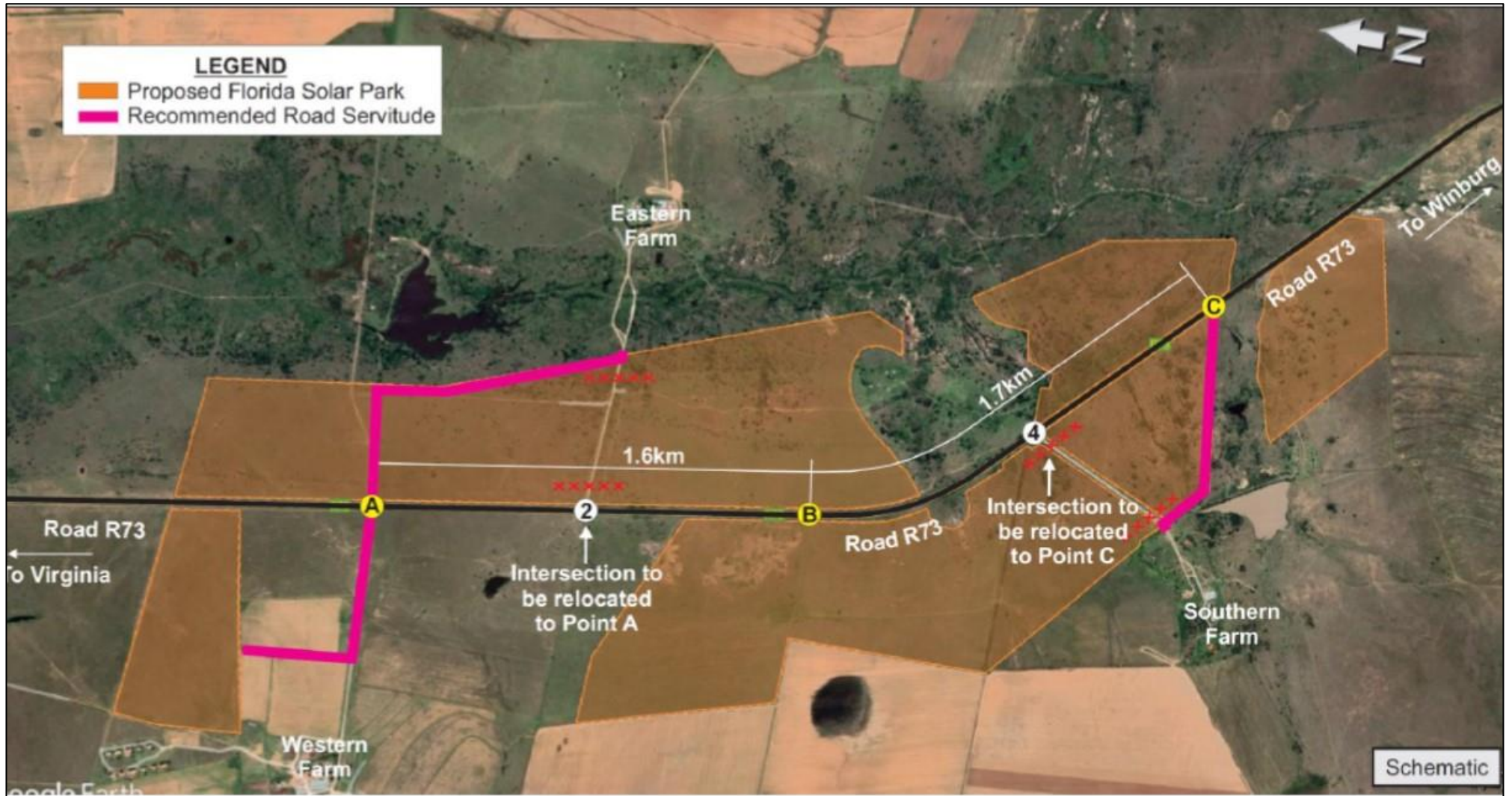


Figure 10. Proposed access points from the regional road R73

5.4.4 TRAFFIC IMPACT OF THE PROPOSED DEVELOPMENT

5.4.4.1 Traffic impact – construction phase

Approximately 150 people are expected to be employed during the construction period (18 months).

As indicated in Table 2.6 of the Traffic Impact Assessment, the expected number of vehicle trips to and from the site during working days peak hour will be 33 during the construction period.

Medium and heavy trucks will access / leave the site only during the working days (Monday to Friday), during daytime. The provision of a fuelling area on the work site could reduce the load of heavy vehicles on public roads. The installation of one steel fuel tanks (capacity of <30 000 litres) is recommended.

5.4.4.2 Traffic impact – operation phase

The traffic impact during the operation phase will be insignificant, considering that about 25 people will work daily on the PV facility, in the following manner:

- During the daytime approximately 17 people.
- During the night-time, approximately 8 people.

As indicated in Table 2.7 of the Traffic Impact Assessment, the expected number of vehicle trips to and from the site during peak hour will be 8 during the operational phase.

5.4.5 LIGHTING SYSTEM

The lighting system will consist of the following equipment:

- Floodlight-towers: maximum 10 meters high, with directional lamps (LED type) of 120 W, installed around the HV loop-in loop-out substation. Normal lighting: 15 lux; up to 40 lux in case of emergency.
- Street lighting along internal roads, for the stretch from the access point up to the HV substation inside the property: 1 streetlamp, maximum 5.5 meters high, every 20 meters, having a LED lamp of 120 W.
- 2x120 W spotlights (LED type) mounted on the top of medium-voltage stations.

The lighting of the MV stations and of the on-site HV substation will be on only in case of intrusion/emergency or necessity to reach the MV stations / HV substation during the night. During the night, the video-surveillance system will use infra-red (or micro-wave) video-cameras, which do not need a lighting system (which could reduce the functioning).

5.4.6 STORMWATER COLLECTION SYSTEM

Given the low rainfall, flat topography and low flow speed of run-off, no formal storm water structures are required as the proposed gravel roads will be developed at ground level so as not to disturb the natural flow of storm water. This means that run-off will not be concentrated, and the existing drainage patterns will be left undisturbed.

5.4.7 WATER REQUIREMENTS

5.4.7.1 Water requirements during the construction phase

The construction phase will last approximately 18 months.

a) Construction of internal gravel roads

- Water is necessary for the construction of internal gravel roads, to get the gravel compacted to optimum moisture content (OMC).
- The surface of internal gravel roads will be approximately 140 000 m².
- 50 liters of water / m² of internal of roads will be required.
- Water consumption for internal roads will be: 140 000 m² x 50 l/m² = 7 000 m³.

b) Workers

- Approximately 150 people are expected to be employed during the construction period, although this number can increase to 300 for short spaces of time during peak periods. This number can be higher in the case the Project Company chooses to build the proposed Solar Park in a timeframe shorter than 18 months (i.e. 396 working days). For example, in the case the construction works are planned to last only 15 months (i.e. 330 working days), the average number of workers required on site during construction is 180.
- Each worker needs 50 liters / 8 working hours for sanitary use.
- Water consumption will be:
 - 150 people x 50 l/person x 396 working days = 2 970 m³ over 18 months, or:
 - 180 people x 50 l/person x 330 working days = 2 970 m³ over 15 months.

c) Concrete production

- Concrete is necessary for the basements of the medium-voltage stations, the high-voltage loop-in loop-out substation, the control building, the warehouse and workshop, the basement of the Battery Energy Storage System (BESS) and for the foundations of the mounting systems. The overall amount of concrete to be produced will be *approximately* 20 000 m³.
- 200 litres of water are needed for 1 cubic meter of concrete.
- Water consumption will be: 20 000 m³ x 200 liters / m³ = **4 000 m³**.

d) Vehicle cleaning

As mitigation measure, the cleaning of vehicles like excavators, mechanical diggers and pile rammers will be done once or twice per month and not during working days, also to not increase the water requirement during construction activities. In order not to waste a large amount of water, high pressure cleaners will be used. Overall, the water requirement for cleaning activity is very low.

Overall and average water consumption during construction is detailed in the following table.

Table 13. Water consumption during the construction phase of the project

WATER REQUIREMENT DURING THE CONSTRUCTION PHASE OF THE PROJECT		
DESCRIPTION	UNIT	TOTAL
Timeframe of the construction activities	<i>months</i>	18
Timeframe of the construction activities - calendar days	<i>days</i>	540
Overall water consumption for internal roads	<i>m³</i>	7 000
Overall water consumption for sanitary use	<i>m³</i>	2 970
Overall water consumption for concrete production	<i>m³</i>	4 000
OVERALL WATER CONSUMPTION	<i>m³</i>	13 970
Daily water consumption (average over 540 calendar days)	<i>m³/day</i>	25.87

Storage tanks will be sized to provide a reserve of water approximately **200 m³**.

5.4.7.2 Water requirements during the operational phase

During operation, water is only required for the operational team on site (sanitary use), as well as for the cleaning of the solar panels. Further water consumption must be only for routine washing of vehicles and other similar uses.

a) Water for sanitary use

Approximately 40 people will be employed during the operation phase of the PV power plant, which will have a lifetime of approximately 35-40 years.

Florida Solar Park will be in operation 7 days per week; therefore, personnel will operate in shifts. The surveillance team will be present during daytime, night-time, and weekends. The average number of people working on site will be of 17 people daytime and 8 people at night. The average daily water consumption for sanitary use is estimated to be 150 litres/day/person for 25 people (17 people daytime and 8 people at night). The daily water consumption will be approximately 3 750 litres/day and **1 370 m³/year**.

b) Water consumption to clean the PV modules

The cleaning activities of the solar panels will take place twice per year. It is assumed that up to 1.0 litre per m² of PV panel surface will be needed. Therefore, the amount of water for cleaning is up to 1 240 m³ per cleaning cycle and **2 480 m³/year**.

PV modules cleaning activity can last less than 1 month. If the cleaning activity lasts approximately 4 weeks (20 working days), the daily water consumption will be approximately **62 000 liters/day, over 20 days**.

5.4.7.3 CONCLUSION

The daily water requirement will be approximately **3 750 liters/day** over 12 months for sanitary use (i.e. **112 500 l/month** and **1 370 m³/year**). The water consumption will increase to up to **65 750 liters/day** during the cleaning of the solar modules (62 000 liters/day for cleaning activity and 3,750 for sanitary use), which will last less than a month and will occur twice a year during the dry period. PV modules are conceived as self-cleaning with rain.

It is further proposed that **90 000 l** of water will be stored in **storage tanks** for fire, emergency and washing of panels twice a year. The overall and average water consumption during operation is detailed in the table below.

Table 14. Water consumption during the operational phase of the project

WATER REQUIREMENT DURING THE OPERATIONAL PHASE		
DESCRIPTION	UNIT	TOTAL
Average daily water consumption for sanitary use	<i>l/day</i>	3 750
Average daily water consumption during cleaning activity (*)	<i>l/day</i>	65 750
Average monthly water consumption for sanitary use (over 30 days)	<i>l/month</i>	112 500
Annual water consumption for sanitary use	<i>m³/year</i>	1 370
Annual water consumption for PV modules cleaning activities (twice/year)	<i>m³/year</i>	2 480
Annual water consumption during operation	<i>m³/year</i>	3 850
Daily water consumption during operation (average over 365 days)	<i>m³/day</i>	10.55

(*) over 20 working days, twice per year

5.4.7.4 Water provision during construction and operation

Water needs for the construction phase (13 970 m³ over approximately 18 months) and the operational phase (3 850 m³/year) will be obtained from on-site boreholes. A Water Use License Application will be submitted to DWS.

5.4.8 SEWERAGE

Considering that the proposed development will not include formal residential properties there is no need to connect to the municipal sewer reticulation system. Sewer reticulation will be handled by a suitable patented and commercially available wastewater treatment system. The sewer system will consist of an installation to serve the offices of the control building. The system will be installed in line with the requirements of the manufacturer. Typical systems consist of a conservancy tank (built underground on site), and a patented digester. Most systems require electricity to power the pumps and fans used in aeration process, although some systems use wind power (whirlybird). The system could require chlorine tablets available commercially.

Effluent from the wastewater treatment system will be suitable for irrigation or re-used in buildings as water for flushing of toilets, or fire-fighting purposes. This could reduce the water requirement of the development substantially. During construction, chemical toilets will be positioned across the construction area at a ratio of 1 toilet for every 15 workers.

Once the project has been awarded Preferred Bidder Status and it is confirmed that the project is going to proceed, a Water Use License Application will be submitted to the Department of Water and Sanitation for all water uses triggered in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998).

5.4.9 REFUSE REMOVAL

During the construction phase, solid waste will mainly consist of vegetation material because of the clearance of vegetation. Other type of solid waste will include, amongst others, wood

from packaging, boxboards, expanded polystyrene and household waste. Vegetation material from clearing activity can be recycled to be re-used as organic fertilizer. Other solid wastes will be recycled as much as possible. Non-recyclable waste will be delivered to the closest legal landfill site.

During the operational phase (approx. 35 to 40 years), solid waste will mainly consist of household waste from the operational team. Other type of solid waste will come from the maintenance activity in case of failure of some components. At the end of the project lifetime, the PV plant will be decommissioned. Silicon of the PV modules and cables (copper and/or aluminium conductor) will be recycled, as well as the aluminium (or zinc steel) frames and piles of the mounting systems.

Florida Solar plant will enter into an agreement with the Matjabeng Local Municipality for the PV plant’s refuse at the nearby municipal refuse site. No refuse will be buried or incinerated on site. Measures to manage waste are included in the attached Draft EMPr.

5.5 TEMPORARY CONSTRUCTION CAMP

The construction camp (± 15ha) will be located on the area planned for the BESS. The BESS is installed right at the end of the development period and is acquired as a complete unit with components. Once the construction camp area has been cleared and cleaned up the BESS will be established on the exact same site as the construction camp.

Table 15. Geographical coordinates of the construction camp & laydown areas

Florida Construction Camp (temporary)		
Point	Longitude	Latitude
P01	26° 54' 31.59" E	28° 11' 09.17" S
P02	26° 54' 26.61" E	28° 11' 08.57" S
P03	26° 54' 28.31" E	28° 11' 16.23" S
P04	26° 54' 53.37" E	28° 11' 16.25" S
P05	26° 54' 53.24" E	28° 11' 14.71" S
P06	26° 54' 33.87" E	28° 11' 05.11" S
P07	26° 54' 32.27" E	28° 11' 04.90" S
Overall footprint		15 ha

The site’s location has been dictated by the nature of the works to be undertaken, specialist studies, site restrictions, town planning intended uses and access. The area identified for the construction site will meet the following requirements:

- sufficient size;
- proximity to existing roads;
- availability of water and energy;
- low environmental and landscape value;
- sufficient distance from residential areas; and
- proximity to the worksite.

To ensure environmental compatibility, the following factors have been considered:

- restrictions on land use (landscape, archaeological, natural, hydrological, etc.);
- terrain morphology;
- presence of high environmental value areas (e.g. wetlands); and

- sand & stone supply.

The establishment of the construction site will be divided into four phases. Steps included here do not follow a time sequence but considered overlapping and simultaneous events.

5.5.1 PHASE I

The area will be fenced to prevent intrusion of animals and to protect against materials theft within the site. A video surveillance system will be provided.

5.5.2 PHASE II

During the fencing operation as described in Phase I, tree species will be cut down and transferred to facilities for wood processing or compost.

5.5.3 PHASE III

At completion of works defined in Phases I and II, the following step will be site clearing and construction of internal roads. An internal road network should ensure two-way traffic of heavy goods vehicles to minimize trips. The road system is planned with a width of 8m (access road) and 4m (internal roads). Roads will comprise of dry and compacted materials. The facility will require constant access control, a weighbridge for heavy trucks, removable structures for storage of tools and temporary storage areas. During Phase III, installation of MV/LV transformers connected to the Eskom grid is planned and laying of underground electrical cables.

5.5.4 PHASE IV

Temporary storage areas of materials and workshops will be constructed and used for:

- temporary storage of photovoltaic modules;
- temporary storage for frames and piles of the mounting systems of the PV arrays;
- storage and processing of building material for construction (sand, gravel, concrete batching and mixing plant, steel, etc.);
- drinking water storage for human consumption;
- worker care facilities and site management buildings,
- prefabricated housing modules for workers who will require accommodation inside the site (only key personnel will be allowed to stay overnight);
- technical cabins and management offices;
- medical care unit in a prefabricated module, in order to allow immediate first aid and minor surgical emergency;
- recreation area and canteen (prefabricated modules);
- parking lots for employees (located close to the staff housing), for visiting staff (located close to the offices area), and for trucks and work vehicles during inactivity;
- workshop and storage facilities on the site for contractors;
- electrical network for living units, offices and service structures;
- water supply for living units through polyethylene pipes connected to storage;
- wastewater treatment system. Treated water will be used for dust suppression.
- temporary chemical toilets; and

- solid waste collection point.

5.5.5 EARTHWORKS

Clearing activity is required to remove shrubs and trees from the planned footprint (± 360 ha). Due to the flatness of the development area, limited earthworks are envisaged for the installation of the PV module mounting systems. The mounting systems will consist of metallic frames to be assembled on-site, supported by pre-bored cast-in-situ concrete piles. Concrete ballasted footing foundations are also possible.

Earthworks will be required during the construction of internal roads and access road / access point. The vertical alignment of the roads will not present any significant challenges due to the flatness of the terrain so that no deep cuts or fills will be required. Considering a road pavement thickness of 300 mm and an overall road surface approximately 140 000 m², the amount of cut or fill is estimated to be approximately 42 000 m³. Underground cables will be laid down along the internal roads.

Given the low rainfall, flat topography and low flow speed of run-off - no formal storm water structures are required as the proposed gravel roads will be developed at ground level, so as not to disturb the natural flow of storm water. This means that run-off will not be concentrated, and the existing drainage patterns will be left undisturbed.

Small earthworks will be required for the installation of the medium-voltage stations and of the Battery Energy Storage System (BESS). None of these activities should require earthworks more than 500 mm cut or fill. Only the foundation plate for the on-site high-voltage substation and of the new Florida 132kV/400kV Substation may require earthworks more than 500 mm cut or fill (the footprints will be 11 250 m² and 22 520 m² respectively). The topsoil stripping will result in temporary spoils heaps which must be spread over the site upon completion of the project.

The concrete necessary for the basements of the medium-voltage stations, the high-voltage substation, the control building and the warehouse will be provided from commercial sources in the vicinity of the development. Gravel needed for construction of internal roads will be obtained from commercial sources in the area.

6 LEGAL AND POLICY REQUIREMENTS

The legislative and regulatory framework of reference for the solar power plant project includes statutory and non-statutory instruments by which National, Provincial and Local authorities exercise control throughout the development of the same project.

The development and the environmental assessment process of a solar power plant project involve various authorities dealing with the different issues related to the project (economic, social, cultural, biophysical etc.).

6.1 REGULATORY AUTHORITIES

6.1.1 NATIONAL AUTHORITIES

At national level, the main regulatory authorities and agencies are:

- *Department of Mineral Resources and Energy (DMRE)*: the Department is competent and responsible for all policies related to energy, including renewable energy. Solar energy is contemplated and disciplined under the White Paper for Renewable Energy and the Department constantly conducts research activities in this respect.
- *National Department of Forestry, Fisheries and the Environment, (DFFE)*: the Department is competent and responsible for all environmental policies and is the controlling authority under the terms of NEMA and EIA Regulations. The DFFE is also the competent authority for the proposed project and is entrusted with granting the relevant environmental authorization.
- *National Energy Regulator of South Africa (NERSA)*: the Regulator is competent and responsible for regulating all aspects dealing with the electricity sector and, in particular, issues the license for independent power producers.
- *South African National Roads Agency Limited (SANRAL)*: the Agency is responsible for all National Road routes.

6.1.2 PROVINCIAL AUTHORITIES

At provincial level, the main regulatory authority is the Free State Department of Economic, Small Business Development, Environment and Tourism (DESTEA); this Department is responsible for environmental policies and is the Provincial authority in terms of NEMA and the EIA Regulations and is also the commenting authority for the proposed project.

6.1.3 LOCAL AUTHORITIES

At a local level, the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the Free State Province, Municipalities and District Municipalities are involved in various aspects of planning and the environment related to solar energy facilities development. The Local Municipalities are Matjhabeng and Masilonyana which form part of the Lejweleputswa District Municipality.

Under the terms of the Municipal System Act (Act no. 32 of 2000), all municipalities are deemed to go through an Integrated Development Planning (IDP) process to devise a five-year strategic development plan for the area of reference.

Identification of priority areas for conservation and their positioning within a planning framework of core, buffer, and transition areas is the subject of bioregional planning. Priority areas are individuated and defined with reference to visual and scenic resources and their identification and protection is granted through visual guidelines drafted for the area included in bioregional plans.

Local authorities also provide specific by-laws and policies to protect visual and aesthetic resources with reference to urban edge lines, scenic drives, special areas, signage, communication masts etc.

Finally, there are also various non-statutory bodies and environmental groups, who are involved in the definition of various aspects of planning and the protection of the environment, which may influence in the development of the proposed project.

6.2 LEGISLATION, REGULATIONS AND GUIDELINES

A review of the relevant legislation involved in the proposed development is detailed in table 5 below.

Table 16. Review of relevant legislation

National Legislation	Sections applicable to the proposed project
Constitution of the Republic of South Africa (Act no. 108 of 1996)	<ul style="list-style-type: none"> • Bill of Rights (S2) • Rights to freedom of movement and residence (S22) • Environmental Rights (S24) • Property Rights (S25) • Access to information (S32) • Right to just administrative action (S33)
Fencing Act (Act no. 31 of 1963)	<ul style="list-style-type: none"> • Notice in respect of a boundary fence (S7) • Clearing bush for boundary fencing (S17) • Access to land for boundary fencing (S18)
Conservation of Agricultural Resources Act (Act no. 43 of 1983)	<ul style="list-style-type: none"> • Prohibition of the spreading of weeds (S5) • Classification of categories of weeds & invader plants and restrictions in terms of where these species may occur (Regulation 15 of GN R0148) • Requirement and methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R0148)
Environment Conservation Act (Act no. 73 of 1989)	<ul style="list-style-type: none"> • National Noise Control Regulations (GN R154 dated 10 January 1992)
National Water Act (Act no. 36 of 1998)	<ul style="list-style-type: none"> • Entrustment of the National Government to the protection of water resources (S3) • Entitlement to use water (S4) - Schedule entitles a person to use water (reasonable domestic use, domestic gardening, animal watering, fire-fighting and recreational use) • Duty of Care to prevent and remedy effects of water pollution (S19) • Procedures to be followed in the event of an emergency incident which may impact on water resources (S20) • Definition of water use (S21) • Requirements for registration of water use (S26 and S34) • Definition of offences in terms of the Act (S151)
National Forests Act (Act no. 84 of 1998)	<ul style="list-style-type: none"> • Protected trees

<p>National Environmental Management Act (Act no. 107 of 1998)</p>	<ul style="list-style-type: none"> • Definition of National environmental principles (S2): strategic environmental management goals and objectives of the government applicable within the entire RSA to the actions of all organs of state, which may significantly affect the environment. • NEMA EIA Regulations 2014 as amended (No. 324, 324, 326, 327 of 7 April 2017). • Requirement for potential impact on the environment of listed activities to be considered, investigated, assessed and reported on to the competent authority (S24 - Environmental Authorisations). • Duty of Care (S28): requirement that all reasonable measures are taken in order to prevent pollution or degradation from occurring, continuing and recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. • Procedures to be followed in the event of an emergency incident which may impact on the environment (S30).
<p>National Heritage Resources Act (Act no. 25 of 1999)</p>	<ul style="list-style-type: none"> • SAHRA, in consultation with the Minister and the MEC of every province must establish a system of grading places and objects which form part of the national estate (S7). • Provision for the protection of all archaeological objects, paleontological sites and material and meteorites entrusted to the provincial heritage resources authority (S35). • Provision for the conservation and care of cemeteries and graves by SAHRA, where this is not responsibility of any other authority (S36). • List of activities which require notification from the developer to the responsible heritage resources authority, with details regarding location, nature, extent of the proposed development (S38). • Requirement for the compilation of a Conservation Management Plan and permit from SAHRA for presentation of archaeological sites for promotion of tourism (S44).
<p>National Environmental Management: Biodiversity Act (Act no. 10 of 2004)</p>	<ul style="list-style-type: none"> • Provision for the MEC for Environmental Affairs/Minister to publish a list of threatened ecosystems and in need of protection (S52). • Provision for the MEC for Environmental Affairs/Minister to identify any process or activity which may threaten a listed ecosystem (S53) Provision for the Member of the Executive Council for Environmental Affairs/Minister to publish a list of critical endangered species, endangered species, vulnerable species and protected species (S56(1) - see Government Gazette 29657. • Three government notices have been published up to date: GN R150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R151 (Lists of critically endangered, vulnerable and protected species) and GN R152 (Threatened Protected Species Regulations).
<p>National Environmental Management: Air Quality Act (Act no. 39 of 2004)</p>	<ul style="list-style-type: none"> • Provision for measures in respect of dust control (S32). • Provision for measures to control noise (S34).
<p>National Environmental Management: Waste Management Act (Act no. 59 of 2008)</p>	<ul style="list-style-type: none"> • Waste management measures. • Regulations and schedules. • Listed activities which require a waste licence.
<p>Occupational Health and Safety Act (Act No. 85 of 1993)</p>	<ul style="list-style-type: none"> • Health and safety of all involved before and after construction must be protected.

<p>Guideline Documents</p>	<p>Sections applicable to the proposed project</p>
<p>South African National Standard (SANS) 10328, Methods for environmental noise impact assessments in terms of NEMA no. 107 of 1998</p>	<ul style="list-style-type: none"> • Impact of noise emanating from a proposed development may have on occupants of surrounding land by determining the rating level. • Noise limits are based on the acceptable rating levels of ambient noise contained in SANS 10103.

<p>Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads</p>	<ul style="list-style-type: none"> The Guidelines outline rules and conditions related to transport of abnormal loads and vehicles on public roads and detailed procedures to be followed for the grant of exemption permits.
<p>Policies and White Papers</p>	<p>Sections applicable to the proposed project</p>
<p>The White Paper on the Energy Policy of the Republic of South Africa (December 1998)</p>	<ul style="list-style-type: none"> The White Paper supports investment in renewable energy initiatives, such as the proposed solar power plant project.
<p>The White Paper on Renewable Energy (November 2003)</p>	<ul style="list-style-type: none"> The White Paper outlines the Government's vision, policy, principles, strategic goals and objectives for the promotion and the implementation of renewable energy in SA.
<p>Integrated Resource Plan (IRP1) Integrated Resources Plan 2010-2030 (IRP 2010). Update of the Integrated Resources Plan 2010-2030 (IRP 2019).</p>	<ul style="list-style-type: none"> The first Integrated Resource Plan (IRP1) was released late 2009. Subsequently the DoE decided to undertake a detailed process to determine South Africa's 20-year electricity plan, the Integrated Resources Plan 2010-2030 (IRP 2010). The IRP1. IRP 2010 and IRP 2019 outline the Government's vision, policy and strategy in matter of the use of energy resources and the current status of energy policies in South Africa. In the IRP 2019, published in October 2019, provision has been made to procure an additional 6 000 MW of solar PV and 14 400 MW of wind between 2022 and 2030.
<p>Renewable Energy IPP Procurement Programme (REIPPPP)</p>	<ul style="list-style-type: none"> The IPP Procurement Programme, issued on 3rd August 2011 by the DoE.
<p>Equator Principles (July 2006)</p>	<ul style="list-style-type: none"> The Equator Principles provide that future developments with total project capital costs of US\$10 million or more shall be financed only if socially and environmentally sustainable.

7 NEED/DESIRABILITY OF THE PROJECT

South Africa's electricity supply still heavily relies upon coal power plants, whereas the current number of renewable energy power plants is still limited. In the last few years, the demand for electricity in South Africa has been growing at a steady rate.

These factors, if coupled with the rapid advancement in community development, have determined the growing consciousness of the significance of environmental impacts, climate change and the need for sustainable development. The use of renewable energy technologies is a sustainable way in which to meet future energy requirements.

In the **IRP 2019**, issued by the Department of Energy (now **Department of Mineral Resources and Energy (DMRE)**) under Notice No. 1360 dated 18 October 2019 in *Government Gazette* 42784, pursuant to the Electricity Regulation Act, provision has been made to procure an additional **6 000 MW** of solar PV and 14 400 MW of wind between **2022** and **2030**.

The purpose of the proposed Florida Solar PV is to add new capacity for the generation of renewable electric energy to the national electricity supply in compliance with the Renewable Energy IPP Procurement Programme (REIPPPP) and to meet the "sustainable growth" of the Free State Province.

The applicant (Piscis Energy (Pty) Ltd) intends to participate with the Florida Solar Park to the next Round of the Renewable Energy IPP Procurement Programme (REIPPPP), to be issued by the Department of Mineral Resources and Energy (DMRE).

The use of solar radiation for power generation is considered a non-consumptive use and a renewable natural resource which does not produce greenhouse gas emissions. The generation of renewable energy will contribute to the growth of South Africa's electricity market, which has been primarily dominated up to this date by coal-based power generation. With specific reference to photovoltaic energy, and the proposed project, it is important to consider that South Africa has one of the highest levels of solar radiation in the world.

The proposed solar park will assist the Eskom grid to meet the high energy demand related to the farming and hospitality activities conducted outside of Virginia town. The purpose of the proposed **Florida Solar PV Plant** is to add new capacity for the generation of electrical energy to the national electricity supply, in compliance with the Minister of Energy's Determinations and to meet the "electricity consumptions' growth" of the Free State Province.

The use of solar radiation for power generation is considered as a non-consumptive use and a renewable natural resource which does not produce greenhouse gas emissions. The generation of renewable energy will contribute to the growth of South Africa's electricity market, which has been primarily dominated up to this date by coal-based power generation. With specific reference to photovoltaic energy, and the proposed project, it is important to consider that South Africa has one of the highest levels of solar radiation in the world.

The reasons for the location of the project in the selected area are as follows:

- low requirement for municipal services;
- compliance with national and provincial energy policies and strategies;
- no impact on people health and wellbeing;
- minimum waste and noise;
- no impact on air quality;
- compatibility with the ecosystem and the surrounding landscape; and
- likelihood of social and economic development of marginalized, rural communities.

7.1 FUTURE NEED AND DESIRABILITY

In 20-30 years time certain of the infrastructure of the solar facility will probably be not be functioning with the same effectivity as when newly constructed. The energy requirements of the country will certainly not become less, but instead will become more dependent on renewable sources like solar and wind energy. It will be the same in this case. Florida Solar Park will most probably never decommission completely as the country and area around it will be dependent on its energy generation. It will rather upgrade then or constantly go through a process of upgrading of technology so that the facility stays abreast of technology and energy needs and requirements in the area.

8 MOTIVATION FOR PREFERRED DEVELOPMENT FOOTPRINT IN THE PREFERRED SITE

8.1 THE CHOICE OF THE FREE STATE PROVINCE AND SITE LOCATION

The Florida Solar PV will be located near the city of Virginia, in the Free State Province. During the previous Rounds of the REIPP Procurement Programme, very few projects were selected by the Department of Energy (now Department of Mineral Resources and Energy) in the Free State Province, compared to Northern and Eastern Cape. The macro-area where the project is planned never received the benefits - in terms of socio-economic development and local content, arising from the previous Rounds of the REIPP Procurement Programme.

The Free State Province and in particular the Matjhabeng Local Municipality (Welkom & Virginia area) has been identified by Piscis Energy (Pty) Ltd as an ideal area for establishing a solar PV plant on the basis of several important considerations:

- there are few green projects currently operating in the Free State Province and it is clear that the “green energy quota” can be achieved mainly by means of solar projects, considering the high solar resources and the availability of lands with low ecological and agricultural value;
- the presence of several mines in the Welkom and Virginia area which require green energy;
- available Eskom grid capacity; and
- other infrastructure nearby to develop a renewable energy project.

In addition to these favourable conditions in terms of desirability of renewable solar energy projects in the Free State Province, the site of the Florida Solar PV has been chosen based on several elements:

- The chosen site is suitable for the installation of a photovoltaic (PV) power plant due to its appropriate morphologically (flat terrain).
- The favourable radiation conditions allow for a high rate of electric energy production, as a combination of latitude-longitude and climatic conditions.
- The low to medium ecological sensitivity of the proposed project site (unused fields, degraded / modified land).
- Available Eskom grid connectivity.

Furthermore, In the **Generation Connection Capacity Assessment 2023 (GCCA 2023)** published in June 2021, Eskom indicated that the current Transmission Network in the Welkom area and the Theseus MTS is available for the connection of new renewable projects for up to 1260 MW at 132 kV. Since, during the last Round 6 of the REIPP Procurement Programme, **240 MW** has been already allocated to the Virginia 1, 2 and 3 Solar Parks, **1 020 MW are still available for connection at Distribution Level (132kV).**

9 CONSIDERATION OF ALTERNATIVES

9.1 DETAILS OF ALTERNATIVES CONSIDERED

The EIA Regulations, 2014, as amended, Section 28(1)(c) and NEMA, Section 24(4), require investigation and consideration of feasible and reasonable alternatives for a proposed development as part of the EIA process. Some possible alternatives for accomplishing the same objectives must be identified and investigated. In particular:

- the property on which, or location where, it is proposed to undertake the activity;
- the location within the current identified site;
- the type of activity to be undertaken;
- the design or layout of the activity;
- the technology to be used in the activity;
- the operational aspects of the activity (schedule, process);
- the sustainability of other alternatives, and
- the option of not implementing the activity (No-Go Alternative).

9.1.1 SITE ALTERNATIVES

Several layout locations have been inspected to find out the best solution for the PV power plant. The following selection criteria were applied:

- Connection availability and proximity
- Land availability
- Sufficient land surface area (± 365 ha)
- Current land use
- Environmental impact (biodiversity)
- Agricultural potential
- Solar radiance
- Socio-economic issues (land cost and local community unemployment)
- Occurrence of Heritage resources

Site Alternative 1

- The landowners agreed that suitable portions 1 & 4 of Florida, RE of Le Roux and RE of Kriegers Kraal that cover an area of 2 365 ha can be used for a PV Park. The suitable area that could be utilized covers approximately 365 ha after sensitive or unusable areas were excluded.
- Large portions of the farms are agricultural lands that have been largely excluded.
- Drainage channels and a heritage site also restricted the area that can be used for a PV Park.
- The Terrestrial Biodiversity Specialist determined the following:
 - Drainage channels in eastern and southern portions of the farm must be excluded.
 - Most of the croplands must be excluded from development.
 - The vegetation unit is classified as having a medium sensitivity due to the widespread status and the degraded grassland has a medium-low sensitivity.

- No CBA areas will be affected by the Solar PV facility. However, only a small portion of the powerline will traverse a small section of a CBA near the Eskom substation.
- The Agricultural Specialist determined after a site visit that the site may be considered as moderate potential grazing land with Moderate potential for arable agriculture considering the climatic conditions, soil physical characteristics and size of land potentially available.
- Four Historical Heritage sites (FSP-CP01, FSP-CP02, FSP-HP01 & FSP-HP02) occur within the proposed Florida Solar Park Project and powerline corridor and impact on the sites is likely. However, sites CP01 & CP02 have NO heritage significance and sites HP01 & HP02 have low heritage significance. NO human burials were located. Monitoring activities will be required throughout the construction phase of the project to avoid the destruction of previously undetected heritage sites and human burials.
- No fatal flaws were identified for the proposed footprint area of approximately 365 ha.

The Generation Connection Capacity Assessment 2023 (GCCA 2023) published in June 2021, Eskom indicated that the current Transmission Network in the Welkom area and the Theseus MTS is available for the connection of new renewable projects for up to 1 260 MW at 132 kV. Since, during the last Round 6 of the REIPP Procurement Programme, 240 MW has been already allocated to the Virginia 1, 2 and 3 Solar Parks, **1 020 MW are still available for connection at Distribution Level (132kV).**

9.1.2 TECHNOLOGY ALTERNATIVES

PV Plant and Solar Thermal Power Plant

The alternative to PV for producing energy from the sun is the thermal solution. There are different forms including linear Fresnel, parabolic trough or tower. These technologies can be with or without thermal storage and they can use diathermic oils or, the more sophisticated ones can use water and/or molten salts. The final choice is the PV option because these kinds of project result in:

- lower construction costs;
- lower operating and maintenance costs (O&M);
- it is a simpler, quicker and more experienced technology; and
- lower environmental impact, considering that, a PV solution requires little water.

Wind Power Plant

Another alternative to PV for producing energy from the sun is electrical energy form wind. A wind energy facility has a significant visual impact especially where it is in a relative flat topographical area. Most important, the project site is not windy enough to be considered suitable for a wind farm. The PV option is thus still a better choice than wind energy based on the same reasons given above.

Alternatives for PV Modules

The proposed types of PV modules are:

- **mono-crystalline or poly-crystalline, mono-facial;**
- **mono- crystalline or poly-crystalline, bi-facial;**

which currently represent the best performing options in terms of reliability and costs/efficiency.

At present, mono/polycrystalline mono-facial modules provide solar conversion efficiency up to 19%.

Bi-facial modules differ from mono-facial module because they can generate from both sides (top and back surfaces) of the module, being the back surface converting the sun light coming from the reflection on the ground. As a result, bi-facial modules can produce up to 30% more than mono-facial modules, depending on the reflection coefficient of the soil. The most of bi-facial modules available on the market are mono-crystalline.

It is important to consider the fact that the PV technology is in continuous evolution, and it may be possible that PV modules achieve a higher solar conversion efficiency in a very short time.

Furthermore, the high volatility of prices of PV modules which depends on the worldwide availability of modules, must be considered. Therefore, the final choice will be taken at the commissioning date, based on the prices and availability of PV modules. In any case, the development will not exceed the current planned footprint (365 ha). Therefore, the final choice of the type of PV modules, whatever it is, will not imply any additional visual or environmental impacts nor the necessity of specific or different mitigation measures.

Considering the current PV market and that bi-facial modules grant a higher energy production compared to mono-facial modules, **mono- crystalline, bi-facial modules** are the **preferred option**.

Alternatives for the Mounting System of the PV Modules

Proposed technical solutions for the proposed solar park entail PV modules mounted on **fixed mounting systems (alternative option 1)** or **horizontal single-axis trackers (alternative option 2)**. The tracking solution is the best performing in terms of efficiency because its energy production is approximately 20% more if compared with fixed systems. This type of technology is characterized by higher technical complexity and higher installing and maintenance costs, if compared with the fixed mounting solution. The selected tracking system is the horizontal single-axis tracker (SAT), which doesn't differ from the fixed system, except for the presence of the tracking devices and the orientation of the rows of the PV arrays (north - south instead of west – east direction).

The technology of mounting systems is under continuous evolution. The final decision about the mounting system technology will be taken at commissioning. The selection of fixed mounting system or horizontal single-axis trackers will not affect the layout of the PV power plant or imply any additional visual or environmental impacts that will necessitate specific or different mitigation measures. The development will not exceed the planned footprint (450 ha) and the height of the structures (PV modules and support frames) will be maximum 4.5 m above ground level. Both fixed and horizontal single-axis tracking solutions grant the

reversibility of the development in respect of the terrain's morphology, geology and hydrogeology. At the end of the PV plant's lifetime, the site can easily be returned to its status prior to the establishment of the PV plant.

Considering the current PV market and that horizontal single-axis trackers grant a higher energy production compared to fixed mounting systems, **alternative option 2 (horizontal single-axis trackers) is the preferred option.**

BESS Technology alternatives and the Risk/Benefit of using Lithium-ion Batteries

Batteries store electrical energy in chemical form. The range of electrochemical technologies include:

- a) batteries with solid electrolyte, as Lithium-ion battery; and
- b) batteries with liquid electrolyte, as Na-S battery, Lead-Acid (PbA) battery, nickel - cadmium (Ni-Cd) battery or other types of liquid metal battery.

The preferred technology for the Battery Energy Storage System ("BESS") is **Lithium-ion battery cells**, which will be pre-assembled at the supplier factory and installed in the containers prior to delivery to the site. Lithium-ion cells technology offers the highest energy density (compared to the other cell technologies), does not suffer from memory effect and is low maintenance. Typical lithium-ion cells used for BESS hold a solid rechargeable electrolyte (the energy accumulator), therefore they don't hold any liquid or gas.

The main benefit of solid ceramic electrolytes is that there is no risk of leaks, which is a serious safety issue for batteries with liquid electrolytes.

A BESS does not emit any gas to the atmosphere during construction and/or normal operation. The containers of the batteries are equipped with a firefighting system conceived to effectively detect smoke and high temperatures and automatically activate the extinguishers to prevent fire. Furthermore, the external metallic surface of the cells is conceived to resist to fire.

The preferred technology is therefore Lithium-ion battery cells with solid rechargeable electrolyte.

Batteries with liquid electrolytes are not preferred for the risk of leakage and consequent potential impacts on environment.

9.1.3 NO-GO ALTERNATIVE / "DO-NOTHING" ALTERNATIVE

9.1.3.1 No-go alternative – negative impacts

The no-go alternative is the option of **not** establishing a Photovoltaic Power Plant on the site, or any of its alternatives. The environment will remain in its current state (status quo). This will have a negative effect of not creating any new employment opportunities, and therefore the anticipated economic benefits of the project will accrue to the study area (see the paragraph 6.4 *Socio-Economic Environment*).

Should this alternative be selected the socio-economic and environmental benefits related to the use of renewable energy resources will not be realised with prejudice to the development of the area.

The main negative impact of the project not proceeding is the potential for renewable energy not being utilized. The electrical infrastructure in South Africa is under great pressure and the demand for energy and electricity is increasing. If the project is not developed, there will be no contribution to the development of the renewable energy sector in South Africa.

The benefits related to the establishment of a renewable energy power plant (which will not happen if the project does not go ahead) are for example analysed in detail in the REFIT Regulatory Guideline published by NERSA (March 2009):

- **Enhanced and increased energy security**: renewable energy plays an important role in terms of power supply, improving grid strength and supply quality and contemporarily reducing transmission and distribution costs and losses.
- **Resource economy and saving**: the energy production by coal fired plants consumes a significant amount of water, this amount of water will be saved if a renewable energy facility like the proposed one is put in operation. This will be beneficial on the large scale for the water conservation measures that the country is currently undertaking.
- **Support of new technologies and new industrial sectors**: the development and establishment of renewable energy power plants contribute to the growth of new technologies and new industrial sectors with benefits for its economy.
- **Exploitation and capitalization of South Africa's renewable resources**: with the aim of increasing energy security.
- **Employment creation and career opportunities**: the construction and operation of a renewable energy power plant contributes to job creation and new career opportunities.
- **Pollution reduction**: the use of renewable energy resources decreases the demand and the dependence from coal and oil for electricity generation.
- **Contrast to Global warming and climate mitigation**: the development of renewable energy contributes to reduce global warming through the reduction of greenhouse gas (GHG) emissions.
- **Protection of natural foundations of life for future generations**: the development and establishment of renewable energy power plants offers the opportunity of consistently reducing the risks related to climate change caused by CO² and CO emissions, therefore preserving life for future generations.
- **Acceptability to society and community**: the use of renewable energy is largely accepted by society and community as a mean to reduce pollution concerns, improve human health and wellness, protect the environment, the ecosystem and climate.
- **Commitment to and respect of international agreements**: considering the possible commitment to the Kyoto Protocol.

9.1.3.2 No-go alternative – positive impacts

Should the No-go alternative be selected then the natural area will not be transformed or cleared from natural vegetation or crops and will still be available for agriculture should it be needed. The positive impact will relate mainly to the terrestrial biodiversity that will not be

disturbed and agricultural sector which could be further developed in this area if the “Do-Nothing” alternative is applied.

9.2 DETAILS OF PUBLIC PARTICIPATION PROCESS UNDERTAKEN

All relevant I&AP's have been identified and involved in the public participation process from the start of the project as per sections 54, 55, 56 and 57 of the EIA regulations 2014, as amended. The process offers an opportunity to become actively involved through constant sharing of information. Main purpose of the public participation process is to ensure that:

- all relevant information in respect of the application is made available to I&APs for their evaluation and review;
- reasonable opportunity is given to I&AP's to comment and to submit queries related to the proposed project;
- comments and queries by the I&APs to the Draft Scoping and to the EIA Reports are submitted and evaluated in a reasonable timeframe and in predetermined terms.

The initial stage of the public participation was conducted from 17 November 2022 until 17 January 2023.

In the enclosed Annexure C, there is a list of all components of the public participation process. The public was informed of the project by means of:

- Site notices, which were put up at the proposed development site;
- Background Information Documents (BID) sent to all adjacent landowners;
- A Notice was published in a local newspaper, which is distributed locally;
- Sending of BIDs to other possible interested and affected parties/stakeholders.

An I&AP Register was created and opened which is maintained and added to as required.

Site notices were put up on site on 18 November 2022.

After a Deed Search was done on the surrounding properties a Background Information Document was sent to the adjacent landowners. Proof of this is attached in Annexure C. A number of these documents were also distributed to the relevant governmental departments including *inter alia* Department of Water and Sanitation, Department of Agriculture, Land Reform & Rural Development, etc. Other identified interested and/or affected parties/stakeholders include Eskom, the Local municipalities, the district municipality etc. Proof of all correspondence is included in Annexure C.

A newspaper notice was published in the 17 November 2022 edition of the Vista Newspaper, which is a local newspaper, distributed locally.

Several people registered as I&APs but no comments were received from adjacent landowners and/or I&APs during the initial public participation process.

- Draft Scoping Report was made available for a 30-day commenting period for comments and was also provided as hard copy on request. The commenting period on the Draft Scoping Report was from 6 March 2023 until 6 April 2023.
- The Final Scoping Report and the Plan of Study for EIA was submitted to the DFFE for review and approval on 17 April 2023. It was accepted by the competent authority on 29 May 2023.
- The Draft EIA Report will be made available for a commenting period of 30 days from 1 August 2023 until 1 September 2023.

- Notifications will be sent out to inform registered I&APs and governmental organizations that the Draft EIA Report was submitted and is available for comments.

9.2.1 FURTHER STEPS IN PUBLIC PARTICIPATION PROCESS

To ensure a transparent and complete public participation process the following steps are still to be taken during the rest of the EIA process:

- Comments received on the Draft EIA Report will be included in the Final EIA Report.
- The Final EIA Report will be submitted to the DFFE for review and Authorisation.
- Registered I&APs and governmental organizations will be notified about the submission of the Final EIA Report to DFFE.
- Registered I&APs and governmental organizations will be notified about the final decision of the DFFE (Environmental Authorisation granted or not).

9.2.2 RESULTS FROM THE PUBLIC PARTICIPATION PROCESS

Comments were received from the Department of Forestry, Fisheries and the Environment and from the Department of Water and Sanitation on the Final Scoping report. Comments were also received from the Biodiversity Conservation Directorate of the Department of Forestry, Fisheries and the Environment.

The Department of Water and Sanitation (**DWS**) does not have any objection regarding the proposed development on condition that that the following aspects are considered prior to commencement of the project:

- Water use licenses must be in place if necessary.
- Sanitary facilities for convenience may not be sited at least 100m from the nearest watercourse.
- Soil erosion control and storm water management must be put in place.
- Adhere to all the sections of the National Environmental Management: Waste Act (Act 59 of 2008) regarding the disposal of waste.
- Any pollution incidents originating from this activity shall be reported to the Department of Water and Sanitation Provincial office within 24 hours.
- All the commitments stipulated in the various parts of the report must be adhered to.

The following comments were received from the Biodiversity Conservation Directorate of the Department of Forestry, Fisheries and the Environment (**DFFE: Biodiversity**):

- The Central Free State Grassland vegetation type occurs in the Free State Province and this vegetation community is considered Least Concern.
- The development footprint avoids all identified highly sensitive environmental features within the project site and no environmental fatal flaws or impacts of very high significance were identified to be associated with the development. Therefore, the proposed development would have an overall medium to low significance rating.
- The following recommendations must be considered in the final report:
 - A pre-construction walk-through of the final development footprint must be undertaken to locate and identify Species of Conservation Concern that can be translocated.

- Sensitive habitats in close proximity to the development footprint must be avoided or demarcated as No-Go area.
 - Permits from relevant authorities must be obtained for the removal or disturbance of any TOPs, Red Data listed or provincially protected plant species.
 - Search and rescue plan, Alien Invasive Species Eradication plan and Rehabilitation plan compiled as part of the Draft EMPr must be included in the final report.
 - Suitable bird repelling structures and bird diverters must be considered to avoid collision of birds with the PV facility.
- The final report must comply with all the requirements as outlined in the Environmental Impact Assessment (EIA) guideline for renewable energy projects and the Best Practice Guideline for Birds & Solar Energy for assessing and monitoring the impact of solar energy facilities on birds in Southern Africa.

All comments have been addressed as indicated in the table in Section 9.3.

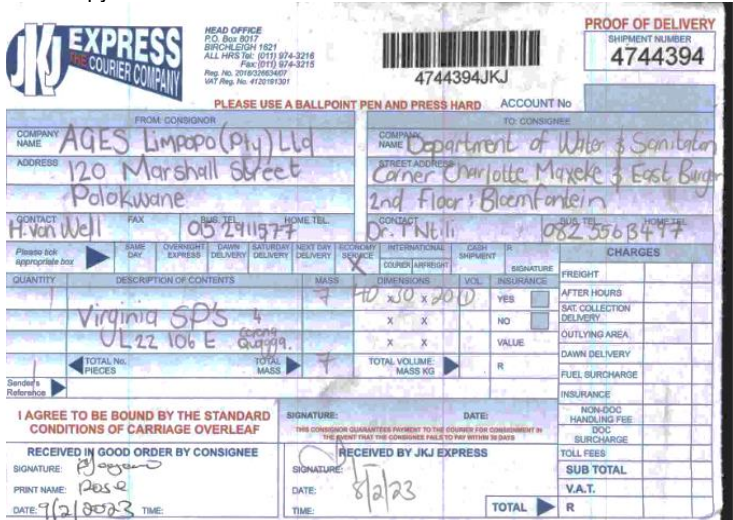
9.3 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>18/11/2022 CONRAD VAN BILJON EMAIL ABERDARE</p>	<p>To Whom it may concern</p> <p>Aberdare Cables is a local level 1 BEE manufacturer of electrical cables and a market leader in the renewable sector.</p> <p>We can provide all the necessary cables needs for this proposed solar facility and will appreciate it if we can obtain more information regarding the proposed plant in order for us to assist were possible.</p> <p>Below are all my contact details should you have any enquiries.</p> <p>Thanking You</p>	<p>18/11/2022 EMAIL AGES</p> <p>Thank you for your email.</p> <p>Unfortunately, AGES are only appointed to conduct an environmental Impact assessment for the solar parks. They have not been approved yet, and we are not involved in any construction.</p> <p>Kind regards</p>
<p>18/11/2022 EMAIL KATHRYN WINSTANLEY G7ENERGIES</p>	<p>Dear Hiadee,</p> <p>I trust you are well.</p> <p>Could you please confirm that Caryn Clarke with e-mail address eia@g7energies.com is registered as an I&AP for these 5 proposed solar projects: Florida SP, Quagga SP, Corona SP, Florida 1 & 2 SP.</p> <p>Thank you very much. With kind regards,</p>	<p>10/01/2023 EMAIL AGES</p> <p>Dear Kathryn</p> <p>Confirmed. eia@g7energies.com is also receiving emails. The Draft Reports will be forwarded as soon as they are available.</p> <p>Kind regards</p>
<p>23/11/2022 EMAIL BOITUMELO MELATO DEPARTMENT OF WATER AND SANITATION</p>	<p>Good day Hiadee,</p> <p>Hope this mail finds you well.</p> <p>Kindly send the below notification as per the details below so that it can be allocated to the relevant case officer. ntilit@dws.gov.za lenongp@dws.gov.za kumaloz@dws.gov.za and copy musekenen2@dws.gov.za regards,</p>	<p>17/01/2023 EMAIL AGES Dear Melato,</p> <p>Thank you for your email. I did send the emails to the relevant officers, but to date no-one has responded with a case officers' details.</p> <p>The Draft Scoping Report will go out for comments shortly, so I will forward the link to all the above. Kind regards</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>19/01/2023 EMAIL</p>	<p>Good day Hiadee,</p> <p>Kindly take note that I am the case officer for this project. Attached is the completed form to register the Department as an interested and affected Party. I will await the submission of the Draft Scoping Report.</p> <p>Regards,</p>	<p>19/01/2023 EMAIL AGES Dear Boitumelo Melato Thank you so much for your registration. The draft Scoping report will be sent to you shortly. Kind regards</p>
<p>23/01/2023 EMAIL</p>	<p>Good day,</p> <p>Hope this mail finds you well.</p> <p>Kindly send me the Draft Scoping Report for the Department's comments as follows. Attention: Dr T Ntili Department of Water and Sanitation Corner Charlotte Maxeke and East Burger 2nd Floor: Bloem Plaza Building Bloemfontein Regards,</p>	
<p>28/11/2022 EMAIL MELANIE MILES DEPUTY HOD PROJECTS LEADS 2 BUSINESS</p>	<p>Good day</p> <p>Please could you forward me a BID document and register me as an interested and affected party for the following 5 projects:</p> <p>Florida Solar Park Quagga Solar Park Florida 1 & 2 Solar Parks Corona Solar Park</p> <p>I look forward to your response. Kind Regards</p>	<p>28/11/2022 EMAIL AGES Dear Melanie Thank you for your registration. I have added you to the I&AP register. Attached please find the BID for your information. Kind regards</p>
	<p>Thank you so much :) Kind Regards</p>	

<p>30/11/2022 EMAIL NOKUKHANYA GASA ARC. AGRICULTURAL RESEARCH COUNCIL</p>	<p style="text-align: center;">FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS: BACKGROUND INFORMATION DOCUMENT – NOVEMBER 2022</p> <hr/> <p style="text-align: center;">RESPONSE FORM FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS</p> <p>CONTACT DETAILS: Title: MISS First Name: NOKUKHANYA Surname: GASA E-mail: Gasan@arc.agril.za Cell: 073 984 3806 Telephone: 012 427 9864 Fax: - Organization (if applicable): Agricultural Research Council Capacity (e.g. Chairperson, member, etc): Environmental Compliance Physical Address: 1134 Park Street Town: Hatfield Code: 0083 Postal Address: P.O. Box 8383 Town: Pretoria Code: 0001</p> <p>YOUR INTEREST IN THE MATTER:</p> <p>1. What is your main area of interest with regards to the proposed project? To know the progress on the application as it proceeds.</p> <p>2. Are there any concerns you would like to raise, at this stage, regarding the proposed project? None at this stage.</p> <p>3. Are there any additional role-players whom we should involve in the process? If "yes", please provide us with their contact details (Name, address & telephone numbers): NO</p> <p>THANK YOU FOR YOUR TIME Please add more pages if necessary</p>	<p>30/11/2022 EMAIL AGES</p> <p>Dear Nokukhanya</p> <p>Thank you for your registration. You have been added to the I&AP list and we will keep you informed as the process proceeds.</p> <p>Kind regards</p>
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DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>02/12/2022 EMAIL THOMAS WILSON SENIOR ENVIRONMENTAL MANAGER SUSTAINABLE DEVELOPMENT DEPARTMENT HARMONY GOLD MINING COMPANY LIMITED</p>	<p>Dear Haidee, I trust you are well. Please provide us with a plan that we can understand where this site is located, to determine where this is relative to our operations. @ Harmony Team – please take note. Regards.</p>	<p>14/12/2022 EMAIL AGES Dear Thomas I have attached the kmz files so that you can see how this will affect Harmony. It would seem as if it will only be the powerlines that will be adjacent to Harmony's property (along with the existing powerlines). Please confirm that the properties in question are Millo 639 remainder and portion 1 that belong to Harmony? Kind regards</p>
<p>14/12/2022 EMAIL DEBBIE WESSELS CONTENT REGULATOR LEADS2BUSINESS</p>	<p>Hi Haidee Hope you are well I was looking at the background document for the 5 solar parks in the Free State and was curious.....what does the RD stand for that is listed behind the town's name? <ul style="list-style-type: none"> ▪ Portions 1 and 4 of Farm FLORIDA 633 and Remaining Extent of the Farm LE ROUX 766, VENTERSBURG RD; ▪ Farms BIDDULPH 329, DE DAM 27 and TEVREDE 361, VENTERSBURG RD; ▪ Farm BLOMSKRAAL 216, VENTERSBURG RD; ▪ Farm DELAPORTE 887 and Farm QUAGGAFONTEIN 3, WINBURG RD; <p>Never seen that before and wondered what it meant? Kind Regards</p> </p>	<p>17/12/2022 EMAIL AGES Hi Debbie I think it's just for REGISTRATION DIVISION. A map reference. Kind regards</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>09/02/2023 EMAIL</p>	<p>Hi Haidee</p> <p>Thanks so much and compliments of the season.</p> <p>Kind Regards</p>	
<p>23/01/2023 EMAIL BOITUMELO MELATO DWS</p>	<p>Good day,</p> <p>Hope this mail finds you well.</p> <p>Kindly send me the Draft Scoping Report for the Department's comments as follows. Attention: Dr T Ntli Department of Water and Sanitation Corner Charlotte Maxeke and East Burger 2nd Floor: Bloem Plaza Building Bloemfontein</p> <p>Regards,</p>	<p>08/02/2023 COURIERED KJK Hard Copy of DSR couriered.</p> 
<p>22/02/2023 EMAIL BOITUMELO MELATO LETTER: DR T NTILI PROVINCIAL HEAD: FREE STATE DWS</p>	<p>Good day,</p> <p>Kindly find the attached copy of comments for your further attention.</p> <p>Regards,</p>	<p>22/02/2023 EMAIL AGES Limpopo</p> <p>Dear Boitumelo</p> <p>Thank you very much for your comments, they will be brought to the attention of the applicant and incorporated into the EIA Report.</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	<p>Dear Sir/Madam</p> <p>DRAFT SCOPING REPORT: PROPOSED PHOTOVOLTAIC VIRGINIA 4 SOLAR PARK ON THE FARM BLOMSKRAAL 216, VENTERSBURG RD, AND CONNECTING POWELINE, MATJHABENG & MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE AGES REF: L22 106 E DFFE REF: 2022-12-0021</p> <p>Reference is hereby made to the document submitted to this Department dated January 2023 for the above-mentioned project as presented to this Department by AGES Limpopo (Pty) Ltd.</p> <p>This office has evaluated the Draft Scoping Report and the comments are as follows;</p> <ul style="list-style-type: none"> • The applicant must take note that any development within 500m from the boundary of any wetland requires to be authorised according to the Department's regulation. The authorisation must be obtained prior commencement of the project. • In page 35 under 4.2.7.3: Water provision during construction and operation, it is mentioned water for the project can be obtained from on-site boreholes and it is noted that this office will be consulted to obtain the necessary authorisation in terms of Section 21(a): "Taking water from a water resource" of the National Water Act, Act 36 of 1998. • The responsibility lies with the applicant to identify all the water uses associated with this project and to obtain the necessary water use authorisation prior commencement of the project. • Erosion and stormwater management must be put in place through all stages of the project. • Sanitary conveniences which causes or is likely to cause pollution of a water resource should not be located within the 1:50 year flood line or 100m of any watercourse or borehole. • All fuel and lubricants must be stored in sealed containers at least 100m from the nearest water course and all reasonable precautions must be taken to prevent any possible pollution. • All sections of the National Environmental Act: Waste Act (Act 59 of 2008) pertaining to the disposal of waste must be adhered to. • The applicant shall further note that in terms of Section 19(1) of the National Water Act: Act 36 of 1998 it is stated that: <i>An owner of land, a person in control of land or a person who occupies or uses the land on which – (a) any activity or process is or was performed or undertaken, or (b) any other situation exists, which causes, has caused or likely to cause pollution to a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring</i>". Therefore, any pollution incident(s) originating from this project shall be reported to Department of Water Sanitation: Free State Operations within 24 hours. • All the commitments stipulated in the various parts of this report must be adhered to and any deviations must be reported to this Department. • Further comments, if any, will be provided during the Environmental Impact Assessment process. <p>You are welcome to contact Ms B Melato at telephone: 051 405 9000 or on e-mail: melatob@dws.gov.za should you have any enquiries.</p> <p>Yours sincerely,</p>	<p>Kind regards</p>

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<p>24/01/2023 EMAIL DR JACK ARMOUR COMMERCIAL MANAGER FREE STATE AGRICULTURE</p>	<p>Hi Hiadee</p> <p>Can you please send the .KZM files for the sites.</p> <p>Thanks</p> <p>Jack</p>	<p>24/01/2023 EMAIL AGES Limpopo</p> <p>Dear Jack</p> <p>As requested, please find attached the KMZ files for the 3 PROPOSED Solar Parks and their powerlines.</p> <p>Please do not hesitate to let me know if you have any comments or concerns?</p> <p>Kind regards</p>
	<p>Dankie Hiadee</p> <p>Ek kan nie van omgewings probleme dink nie – meer krag kan net positief wees! Die oprigting moet net nie die plaaslike paaie vernietig nie, brand gevaar inhou (fire plan NB to be addressed with Matjhabeng Fire Protection Officer Johan Terblanche johanrusmysiel@gmail.com) en werkers nie moeilikheid maak nie (farm safety concerns on neighbouring farms as a result of activity on project site).</p> <p>Die maar bassies ons standaard insette. Sterkte,</p> <p><i>TRANSLATED: Thank you Hiadee</i></p> <p><i>I can't think of environmental problems - more power can only be positive! The construction must not destroy the local roads, pose a fire risk (fire plan NB to be addressed with Matjhabeng Fire Protection Officer Johan Terblanche johanrusmysiel@gmail.com) and not cause trouble for workers (farm safety concerns on neighboring farms as a result or activity on project site). This is basically our standard inputs.</i></p>	<p>Hi Jack</p> <p>Baie dankie vir u positiewe kommentaar, ons sal u bekommernisse en komentaar in die Konsep Omgewings Impakstudie (Draft Environmental Impact Assessment) -verslag aanspreek.</p> <p>Vriendelike groete</p> <p>TRANSLATED:</p> <p><i>Thank you very much for your positive comments, we will address your concerns and comments in the Draft Environmental Impact Assessment report.</i></p> <p><i>Friendly greetings</i></p>

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<p>24/01/2023 EMAIL SITYHILELO NGCATSHA SAHRA</p>	<p>Good afternoon,</p> <p>Please note that all development applications are processed via our online portal, the South African Heritage Resources Information System (SAHRIS) found at the following link: http://sahra.org.za/sahris/ . We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions.</p> <p>Please create an application on SAHRIS and upload all documents pertaining to the Environmental Authorisation Application Process. As per section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA), an assessment of heritage resources must form part of the process and the assessment must comply with section 38(3) of the NHRA.</p> <p>Please note that a fee is required as from 1 January 2023 for all development applications submitted on SAHRIS. Please see the following link: https://sahris.sahra.org.za/content/what-are-sahra-processing-fees-and-banking-details</p> <p>Please pay the required amount of R 2000.00 for each section 38(8) development application. Please upload the proof of payment (PoP) to the respective development application case. Once all documents including all appendices and the PoP are uploaded to the case application, please ensure that the status of the case is changed from DRAFT to SUBMITTED. Please ensure that all documents produced as part of the EA process are submitted as part of the application.</p> <p>Regards</p>	<p>24/01/2023 EMAIL AGES Limpopo</p> <p>Dear Sityhilelo Ngcatsha</p> <p>Thank you for your response. Our heritage specialist will submit the necessary documents onto the SAHRIS system. We as consultants are obliged to send a notification to all the I&APs.</p> <p>Kind regards</p>
		<p>24/01/2023 EMAIL Tobie du Toit AVIATION CONSULTANT</p> <p>Dear Winnie,</p> <p>PHOENIX ENERGY (PTY) LTD (PTY) LTD, is proposing the establishment of a renewable energy generation facilities (Photovoltaic Power Plants)</p>

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		<p>with associated infrastructure and structures, and a power line which will connect the proposed facilities with the existing Eskom Theseus Main Transmission Substation (MTS) which is located within the Matjabeng Local Municipality, Lejweleputswa District Municipality, in the Free State Province.</p> <p>The proposed location of the Florida Photovoltaic Power Plant is on the Farm BLOMSKRAAL 216, located within the Matjabeng Local Municipality, Lejweleputswa District Municipality, Free State Province.</p> <p>AGES (Africa Geo-Environmental Engineering and Science) is contracted to do the Environmental Impact Assessment (EIA) and myself, TCA (Tappas Aviation Consultant), is subcontracted to do the Aviation Impact Assessment and all other requirements and influences regarding aviation on this project.</p> <p>I therefore apply for approval from ATNS through the obstacle committee for approval to continue with the Florida Solar Park and Powerline project. Attached find a drawing showing the points and numbers of the pylons as well as the corner points and numbers of the solar park. Attached find the amended form received from you with all the coordinates and elevations of the solar park corners and the powerline pylons.</p> <p>An as-built application will be sent to you by the contractors with the actual positions of the pylons and corner points of the solar park after the project is completed.</p> <p>Thank you for your assistance.</p> <p>Kind regards,</p> <p>Tobie du Toit 082 603 5033</p>

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<p>03/02/2023 JOHN GEERINGH SENIOR CONSULTANT ENVIRONMENTAL MANAGEMENT GRID PLANNING: LAND AND RIGHTS ESKOM TRANSMISSION DIVISION</p>	<p>Please send me a KMZ file of the affected properties, proposed layout and proposed grid connection. Please find attached Eskom requirements for work at or near Eskom infrastructure and servitudes, as well as a renewable energy setbacks guideline.</p> <p>Kind regards</p> <p>Thanks John</p>	<p>03/02/2023 EMAIL AGES Limpopo Dear John Attached please find the KMZ of ALL the new proposed PV plants in this area, (including the Florida) as well as the Florida SP and Corona SP layout. The others will follow shortly.</p> <p>Please let me know if this is sufficient, or if you require more detail? Kind regards</p>
<p>15/02/2023 EMAIL JOHN GEERINGH (PR SCI NAT) REG. EAP (EAPASA) SENIOR CONSULTANT ENVIRONMENTAL MANAGEMENT GRID PLANNING: LAND AND RIGHTS ESKOM TRANSMISSION DIVISION</p>	<p>Please find attached Eskom requirements for work at or near Eskom infrastructure and servitudes, as well as a setbacks guideline for renewable energy projects.</p> <p>Kind regards</p>	<p>27/02/2023 EMAIL AGES Limpopo</p> <p>Dear John</p> <p>Thank you for your response.</p> <p>Kind regards</p>
<p>17/02/2023 MS MILICENT SOLOMONS ACTING CHIEF DIRECTOR: INTEGRATED ENVIRONMENTAL AUTHORISATIONS DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT SIGNED BY: MR COENRAD AGENBACH</p>	<p>Good day.</p> <p>Please find herein the attached letter for the above mentioned.</p> <p>Please do not respond to this mailbox with any queries related to the decision been issued. All queries on the attached decision must be directed to official whose contact details is listed as enquiries.</p> <p>I hope you find all in order.</p> <p>Thank you.</p> <p>Kind Regards, Lydia Kutu</p>	

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<p>DESIGNATION: DEPUTY DIRECTOR: PRIORITY INFRASTRUCTURE PROJE</p>	<p>Dear Mr Von Well</p> <p>COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED PHOTOVOLTAIC FLORIDA SOLAR PARK ON THE FARM BLOMSKRAAL 216 AND CONNECTING POWERLINE, MATJHABENG AND MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE</p> <p>The Application for Environmental Authorisation and the draft Scoping Report (SR) dated January 2023 and received by the Department on 20 January 2023, refer.</p> <p><u>This letter serves to inform you that the following information must be included to the final SR:</u></p> <p>(a) Specific Comments</p> <p>(i) The screening tool report generated for the Florida Powerline (Annexure P.2) displays the incorrect application category, namely Transformation of land/Indigenous vegetation. A new screening tool report must be generated that has selected the correct application category which is Utilities Infrastructure => Electricity => Distribution and Transmission => Powerline. It is imperative to select the correct application category when generating the screening tool report to accurately screen the proposed activity against the site and analyse the land use suitability for the proposed development. It is also used to guide the applicant on what assessments are required based on the proposed activity and the attributes of the site. The updated screening tool report with the correct application category must be included in the final SR.</p>	<p>FINAL SCOPING REPORT FOR THE PROPOSED PHOTOVOLTAIC FLORIDA SOLAR PARK ON THE FARM BLOMSKRAAL 216 AND CONNECTING POWER LINE, MATHABENG AND MASILONYANA MUNICIPALITIES, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE</p> <p>Your letter dated 17 February 2023 refers.</p> <p>(a) Specific Comments</p> <p>(i) The screening tool report has been generated with the correct application category and is attached as Annexure P.2. The area environmental sensitivities remained the same and the identified additional specialist assessments (agricultural, avian, civil, RFI and geo-tech have been conducted and are attached to the FSR)</p>
	<p>(ii) The co-ordinates in the SR must be specific to each activity and infrastructure that is proposed on the site. The co-ordinates for each corner of the solar field, substations and BESS must be included in the report, i.e., we require that you provide us with the specific development footprints for each development parameter, and not an area outlining the entire site.</p>	<p>(ii) The co-ordinates of each activity and infrastructure are included in the FSR where the specific activities are described (Sections, 4.2.1 – 4.2.3 & 4.3).</p>

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	(iii) Please provide a concise, but complete, summary and bullet list of the project description and associated infrastructure (or project scope). This must include a list of all development components and associated infrastructure.	(iii) The summary required is included in Section 1.3 of the FSR.
	(iv) Kindly ensure the development footprints (hectares/square metres) and specifications of all proposed infrastructure and associated infrastructure during all phases are included in the final SR.	(iv) Development footprints are indicated in the FSR in Sections, 4.2.1 – 4.2.3 & 4.3.
	(v) Kindly take note that when finalising the layout plan the position of all proposed infrastructure and linear activities, which includes but not limited to the following must be illustrated: <ul style="list-style-type: none"> ➤ Solar fields; ➤ Construction camp laydown areas; ➤ Substations; ➤ Internal roads; ➤ Battery energy storage systems (BESS); ➤ Operation and maintenance buildings; and, ➤ Powerlines. 	(v) The proposed layout plans in Figures 2 & 3 and Annexure A indicates the requested infrastructure.
	(vi) The final SR must clearly provide a detailed section which addresses the site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed, as well as the site sensitivity verification and minimum report content requirements for all specialist assessments undertaken, which were included in the screening tool report.	(vi) All identified SSV and specialist studies identified by the screening tool report were conducted and this is indicated in Table 12 in the FSR.
	(vii) Under Section 10: List of Appendices the applicant has selected “Yes” that the proposed development is a Strategic Infrastructure Project. However, under Appendix 5 none of the SIPs were selected. Kindly take note that, if the project is a SIP, then It is mandatory to provide proof of confirmation for SIP applications from the relevant sector representative. Should no proof be provided, the application will be considered as a normal EIA Application. A letter of confirmation for SIP applications can be obtained from the following relevant sector representatives:	(vii) The initial indication that the project will be a SIP was an error. Confirmation was requested from the relevant sector representatives and once this confirmation has been received, it will be forwarded to the Department. In the meantime, please consider the application as a normal EIA Application.

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	<ul style="list-style-type: none"> ➤ Alvino Wild Schutt-Prins: AlvinoW@idc.co.za/ Alvino@presidency.gov.za; or ➤ Tshepo Chuene: TshepoCh@idc.co.za 	
	<p>(b) Listed Activities</p> <p>(i) Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.</p>	<p>(b) Listed Activities</p> <p>(i) All relevant listed activities are applied for and linked to development activities in Table 4, in the FSR.</p>
	<p>(ii) The listed activities represented in the EIAR and the application form must be the same and correct.</p>	<p>(ii) The Listed activities are correct as reflected in the EIA Application form and the FSR. If there are any changes, this will reflect in the EIA Report and if needed an amended application form will be submitted.</p>
	<p>(iii) If the activities applied for in the application form differ from those mentioned in the final SR, an amended application form must be submitted.</p> <p>(iv)</p>	<p>(iii) In case any activities applied for in the application form differ from those mentioned in the FSR, an amended application form will be submitted.</p>
	<p>(v) Please note that the Department’s application form template has been amended and can be downloaded from the following link https://www.dffe.gov.za/documents/forms.</p>	<p>(iv) The latest template on the website was used, dated April 2021.</p>
	<p>(c) Layout & Sensitivity Maps</p> <p>(i) The final SR must provide coordinate points for the proposed development site (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.</p>	<p>(b) Layout & Sensitivity Maps</p> <p>(i) Coordinates are provided in tables 5 & 8 of the FSR.</p>
	<p>(ii) Please provide a layout map which indicates the following:</p> <ul style="list-style-type: none"> a) A clear indication of the envisioned area for the proposed solar fields; b) Position of the solar panels; c) Powerlines; d) Internal roads; e) All supporting onsite infrastructure such as laydown area, guard house and control room etc. (existing and proposed); 	<p>(ii) A layout map is provided in Annexure A and figure 2 of the FSR.</p>

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	f) Substations, transformers, switching stations and inverters; g) Battery Energy Storage System; h) Connection routes (including pylon positions) to the distribution/transmission network; i) All existing infrastructure on the site, especially railway lines and roads; and j) Buildings, including accommodation.	
	(iii) Please provide an environmental sensitivity map which indicates the following: a) The location of sensitive environmental features identified on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; b) Buffer areas; and c) All “no-go” areas.	(iii) Sensitivity maps are included in the different specialist reports.
	(iv) The above layout map must be superimposed (overlain) with the sensitivity map and a cumulative map which shows neighbouring and existing infrastructure. (v) Google maps will not be accepted.	(iv) Layout maps overlain with sensitivity maps indicating buffer areas is provided in Annexure A of the FSR for solar park and power line.
	<p>(d) Alternatives</p> (i) Please provide a description of any identified alternatives for the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity as per Appendix 2 of GN R.982 of 2014 (as amended). (ii) Alternatively, you should submit written proof of an investigation and motivation if no reasonable or feasible alternatives exist in terms of Appendix 2.	<p>(d) Alternatives</p> The reasons for selection of the preferred alternative are explained in section 5.1.1 of the FSR.
	<p>(e) Public Participation Process</p> (i) Comments must be obtained from this Department’s Biodiversity Conservation Directorate at BCAdmin@dffe.gov.za .	<p>(e) Public Participation Process</p> (i) The DSR was submitted to the Biodiversity Conservation Directorate and proof that the report was downloaded is provided in the FSR Comments and Responses Report. Comments have not been received yet. However, the Draft EIA Report will be sent to this

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		<p>directorate again in order to obtain comments. If comments are received on the DSR, it will be forwarded to the official managing the application, immediately.</p>
	<p>(ii) Please ensure that all issues raised, and comments received during the circulation of the SR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final SR, including comments from this Department, and must be incorporated into a Comments and Response Report (CRR).</p>	<p>(ii) All issues raised, and comments received during the circulation of the DSR from registered I&APs and organs of state are included in the CRR.</p>
	<p>(iii) Proof of correspondence with the various stakeholders must be included in the final SR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.</p>	<p>(iii) Proof of all correspondence with stakeholders are included in the CRR.</p>
	<p>(iv) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations 2014, as amended.</p>	<p>(iv) The Public Participation Process was conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations 2014, as amended.</p>
	<p>(v) A comments and response trail report (C&R) must be submitted with the final SR. The C&R report must incorporate all historical comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments.</p>	<p>(v) All comments and responses are included in the CRR in the format required.</p>
	<p>(vi) The final SR must provide evidence that all identified and relevant competent authorities have been given an opportunity to comment on the proposed development.</p>	<p>(vi) Proof that all relevant and competent authorities have been given an opportunity to comment on the BID and DSR is included in the CRR as appended to the FSR.</p>
	<p>(f) Specialist Assessments</p> <p>(i) The specialists undertaking the Desktop Geotechnical Study (Annexure I) failed to submit a signed Specialist Declaration of Interest form. All</p>	<p>(f) Specialist Assessments</p> <p>(i) Signed Specialist Declarations are attached to the FSR as Annexure R.</p>

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	Specialist Declaration of Interest forms must be signed by the relevant specialists and attached to the final SR. The forms are available on the Department's website (please use the Department's template).	
	(ii) The Plan of Study failed to mention the undertaking of a Traffic Impact Assessment for the proposed Solar Park. It is imperative to undertake a Traffic Impact Assessment to determine the traffic impacts of the proposal on the transportation network and whether such development can be accommodated by the current transportation system.	(ii) A scope of work has been included in the Plan of Study and the Traffic Impact Assessment will be included in the Draft EIA Report.
	(iii) The EAP must ensure that the terms of reference for all the identified specialist studies include the following: a) A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint (solar field) and all other associated infrastructures that they have assessed and are recommending for authorisation.	(iii) Because most of the specialist studies have already been conducted, all these details are included in section 9.6 of the FSR and the specialist reports. The requirements are listed in the Plan of Study for the outstanding specialist studies in section 9.6 of the FSR.
	b) Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed.	(b) Limitations to the studies and time of season are addressed in the various specialist studies and all specialist studies were conducted in the right season.
	c) Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas.	(c) No-go areas were identified in the area and the footprint of the solar plant has been designed outside any no-go areas. A buffer area has been drawn around the heritage area (old dam) and is excluded from the development.
	d) Should the specialist definition of 'no-go' area differ from the Department's definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable.	(d) This is not applicable as none of the specialists' definition of a 'no-go' area differs from the Departments' definition.
	e) Bird specialist studies must have support from Birdlife South Africa.	(e) The project was completed in consideration of the BirdLife SA (BLSA) best practice guidelines for solar energy. Information provided by BLSA is included in the report, with reference to threatened species, Important Bird Areas and Eskom's Red Data book on birds. Information from the South African Bird Atlas Project 2 (SABAP2) database has also been included in the report. The report states that

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		information from the monitoring plan must be provided to the BirdLife Renewable Energy Programme. There is continuous liaising with BLSA during the EIA process.
	f) All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.	(f) All specialist studies attached to this FSR are final and provide detailed mitigation measures.
	g) Should a specialist recommend specific mitigation measures, these must be clearly indicated.	(g) Mitigation measures recommended by specialists will be included in the EIA report.
	(iv) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons; and where necessary, include further expert advice.	(iv) No contradicting recommendations were specified by any specialists.
	(v) Please ensure that all mitigation recommendations are in line with applicable and most recent guidelines.	(v) This will be considered during the EIA phase while the EIA report is compiled.
	(vi) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols.	(vi) The aforementioned protocols are implemented throughout the EIA process.
	(vii) As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation registration/member number and status of registration/membership for each specialist.	(vii) The required information is included in Specialist Declaration forms, attached to the specialist studies.
	(viii) Please also ensure that the final SR includes the Site Verification Report as required by the relevant environmental themes and assessments.	(viii) All specialist studies were conducted for the relevant environmental themes and assessments, in the environmental screening tool report.

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	(ix) Please note further that the protocols, if applicable, require certain specialists' to be SACNASP registered. Please ensure that the relevant specialist certificates are attached to the relevant reports.	(ix) All SACNASP registrations, where required, are included in Specialist Declarations, attached to the relevant specialist studies.
	<p>(g) Cumulative Assessment</p> <p>(i) Should there be any other similar projects within a 30km radius of the proposed development site, the cumulative impact assessment for all identified and assessed impacts must be refined to indicate the following:</p> <p>a) Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land.</p>	<p>(g) Cumulative Assessments</p> <p>Cumulative assessments are defined in the different specialist reports. This will be further addressed in the EIA report.</p>
	<p>b) Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.</p>	<p>b. Cumulative impacts will be assessed in the EIA Report.</p>
	<p>c) The cumulative impacts significance rating must also inform the need and desirability of the proposed development.</p>	<p>c. This will be further addressed in the EIA Report.</p>
	<p>d) A cumulative impact environmental statement on whether the proposed development must proceed.</p>	<p>d. No fatal flaws were raised by any specialist regarding the possible cumulative impacts of the proposed solar park and power line.</p>
	<p>(h) General</p> <p>You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states that: <i>"If S&EIR must be applied to an application, the applicant must, within 44 days of receipt of the application by the competent authority, submit to the competent authority a scoping report which has been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority"</i>.</p> <p>You are further reminded that the final SR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content</p>	<p>(h) General</p> <p>All timeframes will be adhered to as prescribed in the EIA Regulations, 2014, as amended. The scoping report was compiled according to Appendix 2 of the EIA Regulations, 2014, as amended. If a timeframe cannot to complied to, the applicant will apply for an extension of the timeframe in terms of Regulation 3(7) of the EIA Regulations, 2014, as amended.</p> <p>The applicant has been informed that no activity may commence prior to an Environmental Authorisation being granted by the Department.</p>

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	<p>of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.</p> <p>Further note that in terms of Regulation 45 of the EIA Regulations 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless an extension has been granted in terms of Regulation 3(7).</p> <p>You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.</p> <p>Yours sincerely</p> <p>Annexure 1 Format for Comments and Response Report</p> <table border="1"> <thead> <tr> <th>Date of comment, format of comment name of organisation/I&AP,</th> <th>Comment</th> <th>Response from EAP/Applicant/Specialist</th> </tr> </thead> <tbody> <tr> <td>27/03/2021 Email Department of Forestry, Fisheries and the Environment: Priority Infrastructure Projects (Joe Soap)</td> <td>Please record C&R trail report in this format. Please update the contact details of the provincial environmental authority.</td> <td>EAP: (Noted)The C&R trail report has been updated into the desired format, see Appendix K. EAP: Details of provincial authority have been updated, see page 16 of the Application form.</td> </tr> </tbody> </table>	Date of comment, format of comment name of organisation/I&AP,	Comment	Response from EAP/Applicant/Specialist	27/03/2021 Email Department of Forestry, Fisheries and the Environment: Priority Infrastructure Projects (Joe Soap)	Please record C&R trail report in this format. Please update the contact details of the provincial environmental authority.	EAP: (Noted)The C&R trail report has been updated into the desired format, see Appendix K. EAP: Details of provincial authority have been updated, see page 16 of the Application form.	<p>I trust you find this in order.</p> <p>Yours sincerely</p>
Date of comment, format of comment name of organisation/I&AP,	Comment	Response from EAP/Applicant/Specialist						
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<p>27/02/2023 EMAIL MASHUDU MUDAU BIODIVERSITY MAINSTREAMING & EIA DEP OF FORESTRY, FISHERIES AND THE ENVIRONMENT ENVIRONMENT HOUSE</p>	<p>Good day Hiadee.</p> <p>I trust you are well.</p> <p>Kindly note that we have not provided comments due to we did not receive notification for this project.</p> <p>May you kindly send to us your proof of submission.</p>	<p>27/02/2023 EMAIL AGES Limpopo</p> <p>Dear Biodiversity admin</p> <p>Do you have any idea when we can expect comments from your section? We would like to submit our Final Scoping report and EIA section would like comments from BIODIVERSITY.</p>						

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>01/03/2023 EMAIL MASHUDU MUDAU</p>	<p>Good day Hiadee.</p> <p>I trust you are well.</p> <p>I do acknowledge that we have downloaded the DSR on the 20th February, unfortunately am not able to give you the exact date of when we will be able to provide comments, as this depends on whether the case officer(s) (cc'd above) will be able to provide you with comments as soon as possible as we only received the notification on the 20th.</p> <p>I hope you find this in order.</p>	<p>27/02/2023 EMAIL AGES Limpopo</p> <p>Dear Mashudu Mudau</p> <p>I'm not sure what happened... I think there was some or other glitch in my emails on 23 January 2023 when the original DSR was sent out, as I cannot find the sent email.</p> <p>I sent another link on 20 February via wetransfer of the DSR, which BCADMIN downloaded on 20 February 2023 (see attached email PROOF)</p> <p>I realise that I should have followed up, and I apologise for asking this, I would just like to know when I can expect the comments, so that I can let EIAs know that the comments are imminent.</p> <p>Again apologies</p>
<p>01/03/2023 EMAIL MS MMATLALA RABOTHATA DEPARTMENT OF FORESTRY FISHERIES AND THE ENVIRONMENT</p>	<p>Dear Hiadee,</p> <p>Based on the email below and the time that is allocated to me to provide the comments on the DSR, kindly be informed that I will not be able to provide the comments by Friday. It will be appreciated to submit the DEIR to Directorate BC and I will provide the comments on it.</p> <p>Trust that you find this is order.</p>	<p>01/03/2023 EMAIL AGES Limpopo</p> <p>Dear Ms Mmatlala Rabothata</p> <p>Thank you so much for your email.</p> <p>We will indicate this to Department of, Forestry, Fisheries, and the Environment: Chief Director: Integrated Environmental Authorisations when submitting the Final Scoping Report.</p> <p>We will send you the Draft EIAR and await comments on that report.</p> <p>Kind regards</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>01/03/2023 KAMOGELO MATHETJA DFFE BIODIVERSITY</p>	<p>Dear Sir/Madam</p> <p>DFFE Directorate: Biodiversity Conservation hereby acknowledge receipt of the invitation to review and comment on the project mentioned on the subject line. Kindly note that the project has been allocated to Mrs M Rabothata and Mr K Mathetja (Both copied on this email). In addition, kindly share the shapefiles of the development footprints/application site with the Case Officers.</p> <p>Please note: All Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries must be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of Mr Seoka Lekota</p> <p>Regards,</p>	
<p>07/03/2023 EMAIL LYDIA KUTU INTEGRATED ENVIRONMENTAL AUTHORISATIONS: PRIORITY INFRASTRUCTURE DEVELOPMENTS</p>	<p>Dear Sir/Madam</p> <p>ACKNOWLEDGEMENT OF RECEIPT OF THE FINAL SCOPING REPORT AND AMENDED APPLICATION FORM FOR THE PROPOSED PHOTOVOLTAIC FLORIDA SOLAR PARK ON THE FARM BLOMSKRAAL 216, AND CONNECTING POWERLINE, MATJHABENG & MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE.</p> <p>The Department confirms having received the Final Scoping Report and Amended Application Form for the abovementioned project on 06 March 2023. You have submitted these documents to comply with the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended.</p> <p>You are hereby reminded of Section 24F of the National Environmental Management Act 1998 (Act No. 107 of 1998), as amended, that no activity may commence prior to an Environmental Authorisation being granted by the Department.</p> <p>Kind Regards,</p>	

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
<p>19/04/2023 EMAIL MR SABELO MALAZA CHIEF DIRECTOR: INTEGRATED ENVIRONMENTAL AUTHORISATIONS DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT SIGNED BY: MR COENRAD AGENBACH DESIGNATION: DEPUTY DIRECTOR: PRIORITY INFRASTRUCTURE PROJECTS</p>	<p>ACCEPTANCE OF THE SCOPING REPORT FOR THE PROPOSED PHOTOVOLTAIC FLORIDA SOLAR PARK ON THE FARM BLOMSKRAAL 216 AND CONNECTING POWER LINE IN THE MATJHABENG AND MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT MUNICIPALITY IN THE FREE STATE PROVINCE</p> <p>The final Scoping Report (SR) and the Plan of Study for Environmental Impact Assessment dated February 2023 and received by the Department on 06 March 2023, refer.</p> <p>The Department has evaluated the submitted final SR and the Plan of Study for Environmental Impact Assessment dated February 2023 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. The final SR is hereby accepted by the Department in terms of Regulation 22(1)(a) of the EIA Regulations, 2014, as amended.</p> <p>You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the EIA Regulations, 2014, as amended.</p> <p>In addition, the following amendments and additional information are required for the EIAR:</p>	<p>DRAFT EIA REPORT FOR THE PROPOSED PHOTOVOLTAIC FLORIDA SOLAR PARK ON THE FARM BLOMSKRAAL 216 AND CONNECTING POWER LINE, MATHABENG AND MASILONYANA MUNICIPALITIES, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE</p> <p>Your Scoping approval letter dated 19 April 2023 refers.</p>
	<p>(a) Specific Comments</p> <p>i The co-ordinates in the EIAR must be specific to each activity and infrastructure that is proposed on the site. The co-ordinates for each corner of the solar fields, the substations, BESS, power line route, and laydown areas must be included in the EIAR, i.e., we require that you provide us with the specific development footprints for each development parameter, and not an area outlining the entire site.</p>	<p>(a) Specific Comments</p> <p>(i) The coordinates of the PV plant footprint, construction camp that will become the BESS, on-site substation and connecting powerline are included in the DEIAR in tables 3 - 6.</p> <p>(ii) The summary required is included in Section 5.4 of the EIAR.</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	<p>ii Please provide a concise, but complete, summary and bullet list of the project description and associated infrastructure (or project scope) to be included in the decision (or as it should appear in the decision), should a positive Environmental Authorisation be granted. This must include a list of all development components and associated infrastructure.</p>	
	<p>iii Please provide a detailed description as well as any associated assessments related to the technology required for the Battery Energy Storage System (BESS).</p>	<p>(iii) See Section 5.4.2 of the EIAr.</p>
	<p>iv The EIAr must clearly provide a detailed section which addresses the site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed, as well as the site sensitivity verification and minimum report content requirements for all specialist assessments undertaken, which was included in the screening tool report. Kindly take note that this should be in the form of a report and should either confirm or dispute the sensitivity ratings for each theme identified by the screening tool report. Please refer to 1. Site sensitivity verification and minimum report content requirements of the Protocol document.</p>	<p>(iv) All identified SSV and specialist studies identified by the screening tool report were conducted as indicated in Table 16 in the EIAr.</p>
	<p>(b) Listed Activities</p> <p>i The listed activities applied for in the application form have been quoted incorrectly, as they do not correlate with the listed activities in the EIA Regulations 2014, as amended. The following discrepancies were noted with regards to the activities applied for in the application form:</p>	<p>(b) Listed Activities</p> <p>(i)</p>
	<p>➤ “Activity 12 (xii)(c) of Listing Notice 1”- These sub activities have been changed with the recent amendments to the EIA Regulations made in 2017. The Activity should be referenced as “Activity 12 (ii)(c) of Listing Notice 1”.</p>	<p>➤ Corrected in Table 7 of the EIAr and attached amended application form.</p>
	<p>➤ “Activity 12 (i)(ii)(iii) of Listing Notice 3”- Is quoted incorrectly and failed to apply for the applicable province the activity occurs in, “b. Free State” and not “a. Eastern Cape.” Furthermore, the sub activity (iii) refers to “On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open</p>	<p>➤ Corrected in Table 7 of the EIAr and attached amended application form. No CBAs are traversed because of the shorter powerline route and Activity 12 (b)(ii) has been removed.</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	<p><i>space, conservation or had an equivalent zoning;</i>” and this does not correlate to the description provided in the Scoping Report and application form. The Activity should be quoted as “<i>Activity 12 (b)(i)(ii) of Listing Notice 3</i>”</p> <p>Kindly ensure all activities applied for in the application form and the EIAR are applicable to the proposed development and are quoted correctly as per the EIA Regulations 2014, as amended.</p>	<p>Noted.</p>
	<p>ii. The listed activities and the description of the activities applied for in the application form and the final SR are not the same. Kindly ensure the listed activities and the description of activities represented in the EIAR and the application form are the same and correct.</p>	<p>ii. Corrected in Table 7 of the EIAR and attached amended application form.</p>
	<p>iii. The EIAR must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for.</p>	<p>iii. Noted.</p>
	<p>iv. The listed activities represented in the EIAR and the application form must be the same and correct.</p>	<p>iv. Noted.</p>
	<p>v. The EIAR must assess the correct sub listed activity for each listed activity applied for.</p>	<p>v. Noted.</p>
	<p><u>(c) Public Participation</u></p> <p>i Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAR. This includes but is not limited to the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs, the Matjhabeng Local Municipality, the Masilonyana Local Municipality, the Lejweleputswa District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA), the Department of Mineral Resources and Energy, and the Department of Forestry, Fisheries and the Environment: Directorate Biodiversity and Conservation.</p>	<p><u>(c) Public Participation Process</u></p> <p>(i) All comments and responses are included in Section 9.3 of the DEIAR and Annexure C. Please take note that due to the shorter powerline, none of the components of this application falls within the jurisdiction of Masilonyana Local Municipality.</p>
	<p>ii Please ensure that all issues raised, and comments received during the circulation of the draft SR and draft EIAR from registered I&APs and organs of state</p>	<p>(ii) All issues raised, and comments received during the circulation of the DSR from registered I&APs and organs of state are included in</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	<p>which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.</p>	<p>the CRR (Annexure C). Proof that all relevant and competent authorities have been given an opportunity to comment on the BID and DSR is included in the CRR as appended to the EIAr.</p>
	<p>iii A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. The C&R report must be a separate document from the main report and the format must be in the table format as indicated in Annexure 1 of this comments letter. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as “noted” is not regarded as an adequate response to I&AP’s comments</p>	<p>(iii) All comments and responses are included in the CRR in the format required.</p>
	<p>iv Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually.</p>	<p>(iv) Responses to comments were made individually as indicated in Section 9.3 of the DEIAR and Annexure C.</p>
	<p>v The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations, 2014, as amended.</p>	<p>(v) The Public Participation Process was conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA Regulations 2014, as amended.</p>
	<p>(d) Layout & Sensitivity Maps</p> <p>i The EIAr must provide coordinate points for the proposed development site and all proposed infrastructure (note that if the site has numerous bend points, at each bend point coordinates must be provided) as well as the start, middle and end point of all linear activities.</p>	<p>(d) Layout & Sensitivity Maps</p> <p>(i) Coordinate points are provided in tables 3 - 6 of the DEIAR.</p>
	<p>ii The EIAr must provide a copy of the final preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g., roads. The layout map must indicate the following:</p> <p>a) A clear indication of the envisioned area for the proposed solar fields.</p>	<p>(ii)</p> <p>Layout maps are provided in Annexure A.</p>

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	b) Internal roads. c) All supporting onsite infrastructure such as laydown area, guard house and control room etc. d) Substations, transformers, switching stations and inverters. e) Battery Energy Storage System. f) Power line route (including pylon positions) to the distribution/transmission network; and g) All existing infrastructure on the site, especially railway lines and roads.	
	iii. Please provide an environmental sensitivity map which indicates the following: a) The location of sensitive environmental features identified on site, e.g. CBAs, protected areas, heritage sites, wetlands, drainage lines etc. that will be affected by the facility and its associated infrastructure; b) Buffer areas; and c) All “no-go” areas.	(iii) _____ Sensitivity maps are included in the different specialist reports.
	iv. The above layout map must be superimposed (overlain) with the sensitivity map and a cumulative map which shows neighbouring and existing infrastructure.	iv. _____ Layout maps overlain with sensitivity maps for solar park and power line, indicating buffer areas are provided in Annexure A.
	(v) Google maps will not be accepted.	v. _____ Noted
	<p>(e) Specialist assessments</p> i Page 45 of the final SR stipulates that a Traffic Impact Assessment would be conducted and included in the draft EIAR, however Page 105 of the final SR does not list a Traffic Impact Assessment as one of the specialist studies to be undertaken in the EIA phase. Kindly confirm whether this study would be undertaken and ensure the information provided throughout the EIAR is consistent and uniform.	<p>(e) Specialist Assessments</p> (i) A Traffic Impact Assessment has been conducted and is attached as Annexure K of the Draft EIAR.
	ii The EAP must ensure that the terms of reference for all the identified specialist studies must include the following: a) A detailed description of the study’s methodology; indication of the locations and descriptions of the development footprint, and all other associated	(ii) : _____ (a) All these details are included in the specialist reports attached as annexures.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	infrastructures that they have assessed and are recommending for authorisation.	
	b) Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed.	(b) All specialist studies were conducted in the right season and limitations are listed where applicable.
	c) Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas.	(c) No-go areas were identified, and the footprint of the solar plant has been designed outside any no-go areas. Buffer areas have been drawn around the heritage area (old dam) and drainage channels that are excluded from the development. These buffer areas are indicated on the maps in Annexure A.
	d) Should the specialist definition of 'no-go' area differ from the Department's definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable.	(d) This is not applicable as none of the specialists' definition of a 'no-go' area differs from the Departments' definition.
	e) All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.	(e) All specialist studies attached to this draft EIAr are final and provide detailed mitigation measures.
	f) Should a specialist recommend specific mitigation measures, these must be clearly indicated.	(f) Mitigation measures recommended by specialists are included in Section 10.2 of the draft EIAr and the EMPr.
	iii Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons; and where necessary, include further expertise advice.	(iii) No contradicting recommendations were specified by any specialists.
	iv It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting in identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in	(iv) The protocols are implemented throughout the EIA process.

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	<p>Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. Please note that specialist assessments must be conducted in accordance with these protocols</p>	
	<p>v Please also ensure that the EIAr includes the Site Verification Report and Compliance Statements (where applicable) as required by the relevant themes.</p>	<p>(v) All specialist studies were conducted for the relevant environmental themes and assessments as identified in the environmental screening tool report.</p>
	<p>vi Please note further that the protocols, if applicable, require certain specialists' to be SACNASP registered in the field of expertise of the specialist study being undertaken e.g. An aquatic assessment must be prepared by a specialist registered with SACNASP, with expertise in the field of aquatic sciences. Please ensure that the relevant specialist certificates are attached to the relevant reports.</p>	<p>(vi) All SACNASP registrations, where required, are included in Specialist Declarations.</p>
	<p>vii <u>As such, the Specialist Declaration of Interest forms must also indicate the scientific organisation registration/member number and status of registration/membership for each specialist.</u></p>	<p>(vii) The required information is included in Specialist Declaration forms.</p>
	<p>viii The following Specialist Assessments will form part of the EIAr:</p> <ul style="list-style-type: none"> ➤ Terrestrial Biodiversity Impact Assessment; ➤ Avifaunal Assessment; ➤ Wetland and Riparian Delineation & Aquatic Biodiversity Report; ➤ Archaeological Impact Assessment; ➤ Palaeontological Impact Assessment for Solar Park; ➤ Desktop Geotechnical Investigation; ➤ Preliminary Visual Impact Assessment; ➤ Agricultural Agro-Ecosystem Impact Assessment Report; ➤ Civil Aviation Assessment Report; ➤ Radio Frequency Interference Impact Assessment; ➤ Socio-Economic Impact Assessment; ➤ Palaeontological assessment for the power line route; and 	<p>(viii) <i>The following Specialist Assessments will form part of the EIAr:</i></p> <ul style="list-style-type: none"> ➤ All these studies are attached as Annexures to the draft EIAr.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	➤ Visual Impact Assessment	
	ix Please ensure that each specialist study has the correct and same project description and layout to assess.	(ix) That is the case.
	x Please include a table that shows the proposed studies and the relevant specialists carrying out the study. In addition, a summary should be included of the specialist's recommendations in terms of the alternatives that are preferred based on the findings of their study.	(x) Table included under Section 11 of the draft EIAr.
	<p>(f) Cumulative Assessment</p> <p>(i) As there are other similar projects within a 30km radius of the proposed development site, a cumulative impact assessment for all identified and assessed impacts must be conducted and must indicate the following:</p> <p>a) Identified cumulative impacts must be clearly defined, and where possible the size of the identified impact must be quantified and indicated, i.e. hectares of cumulatively transformed land.</p>	<p>f. Cumulative Assessments</p>
	b) Detailed process flow and proof must be provided, to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.	<p>(i) a. Cumulative assessments are defined in the different specialist reports. The significance of cumulative impacts is assessed and rated in the tables in Section 10.2 of the draft EIAr.</p>
	c) The cumulative impacts significance rating must also inform the need and desirability of the proposed development.	b. The significance of cumulative impacts is assessed and rated in the tables in Section 10.2 of the draft EIAr.
	d) A cumulative impact environmental statement on whether the proposed development must proceed.	c. All the cumulative impacts have been rated between low-medium and medium without mitigation measures.
		d. No fatal flaws were raised by any specialist regarding the possible cumulative impacts of the proposed solar park and power line and all cumulative impacts can be mitigated to low, medium-low and medium impacts – section 10.2.
	<p>(g) General</p>	<p>g. General</p>

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	<p>i The EIAr must provide the technical details for the proposed facility in a table format as well as their description and/or dimensions. A sample for the minimum information required is listed under Annexure 2 below.</p>	<p>i. Technical details listed in Table 8 of draft EIAr.</p>
	<p>ii The EAP must provide landowner consent for all farm portions affected by the proposed project i.e., all farm portions where the access road, solar field and associated infrastructure are to be located.</p>	<p>(ii) Landowner's consent is attached to the amended application form.</p>
	<p>iii A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final EIAr, including the Generic EMPr for substations and power lines.</p>	<p>(iii) EMPr's are attached as Annexure R.</p>
	<p>The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations.</p> <p>You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.</p> <p>Yours faithfully</p>	<p>The applicant has been informed that no activity may commence prior to an Environmental Authorisation being granted by the Department.</p> <p>Please note that the Listed Activities have been amended and an amended EIA application form is therefore attached.</p> <p>I trust you will find this in order.</p> <p>Yours sincerely</p>

9.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH PROPOSED PV SOLAR PARK

The receiving environment has been described using a combination of specialist inputs, on-site observations, review of existing literature and utilizing Geographic Information Systems (GIS) planning tools.

9.4.1 PROPERTY DESCRIPTION AND CURRENT LAND USE

The proposed PV development site is located ±18 km southeast of Virginia town directly west of the R70 tar road within the Matjhabeng Local Municipality in the Lejweleputswa District of the Free State Province, on the **Farm Blomskraal 216 Ventersburg RD.**

Table 17. PV Park property details

Florida PV plant - project site Property details	
Farm	Florida 633, Ventersburg RD
Portion	Portion 1
LPI code	F03500000000063300001
Overall Extent	709.5842 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Diagram deed number	T1509/1946
Title deed number	T11996/1979
Registration date	19791221
Current land use	Grazing, game farming and croplands
Farm	Florida 633, Ventersburg RD
Portion	Portion 4
LPI code	F03500000000063300004
Overall Extent	579.3031 hectares
Landowner	PIENAAR GERTRUIDA THEODORA
Diagram deed number	T28107/1998
Title deed number	T8154/2021
Registration date	20210611
Current land use	Grazing, game farming and croplands
Farm	Le Roux 766, Ventersburg RD
Portion	Remaining Extent
LPI code	F03500000000076600000
Overall Extent	451.3239 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Diagram deed number	T28108/1998
Title deed number	T16446/2011
Registration date	201111003
Current land use	Grazing, game farming and croplands
Farm	KRIEGERS KRAAL 708, Ventersburg RD
Portion	Remaining Extent
LPI code	F03500000000070800000
Overall Extent	707.9175 hectares
Landowner	FLORIDA BOERDERY (PTY) LTD
Diagram deed number	G00/1880
Title deed number	T11433/2021

Registration date	20210826
Current land use	Grazing, game farming and croplands

The **Florida 132 kV Powerline** will traverse the farms listed in Table 18 and all located within the Matjhabeng Local Municipality.

Table 18. Properties to be crossed by the Florida 132 kV Powerline

Florida 132 kV Powerline	
Properties crossed by the proposed powerline alignment	
Farm	Florida 633, Ventersburg RD
Portion	Portion 1
LPI code	F03500000000063300001
Overall Extent	709 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Title deed number	T11996/1979
Current land use	Grazing, game farming and croplands
Farm	Florida 633, Ventersburg RD
Portion	Portion 4
LPI code	F03500000000063300004
Overall Extent	579 hectares
Landowner	PIENAAR GERTRUIDA THEODORA
Title deed number	T8154/2021
Current land use	Grazing, game farming and croplands

The **Florida 132kV/400kV Substation** is planned to be located on **Portion 1 of the Farm Florida 633, Ventersburg RD**, described in the table above.

The **Florida 400kV Powerline** will traverse the farms listed in Table 19, located within the Matjhabeng and Masilonyana Local Municipalities.

Table 19. Properties to be crossed by the Florida 400 kV Powerline

Florida 400 kV Powerline	
Properties crossed by the proposed powerline alignment	
Farm	Florida 633, Ventersburg RD
Portion	Portion 1
LPI code	F03500000000063300001
Overall Extent	709 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Title deed number	T11996/1979
Current land use	Grazing, game farming and croplands
Farm	Welgelegen 382, Theunissen RD
Portion	Portion 2 (Remaining Extent)
LPI code	F03300000000038200002
Overall Extent	245 hectares
Landowner	VAN HUYSSTEEN JOHAN ABRAHAM
Title deed number	T1072/1986
Current land use	Grazing, game farming

Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Welgelegen 382, Theunissen RD Portion 22 (Remaining Extent) F03300000000038200022 3.1 hectares TRANSNET LTD T6138/1964 Railway
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Welgelegen 382, Theunissen RD Portion 24 F03300000000038200024 242 hectares VAN HUYSSSTEEN KINDER TRUST T7002/2013 Grazing, game farming
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Bloemhoek 509, Theunissen RD Remaining Extent F03300000000050900000 708 hectares B J G STADTLANDER FAMILIE TRUST T3377/2002 Grazing, game farming
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Bloemhoek 509, Theunissen RD Portion 2 (Remaining Extent) F03300000000050900002 187 hectares VAN HUYSSSTEEN KINDER TRUST T7002/2013 Grazing, game farming
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Bloemhoek 509, Theunissen RD Portion 3 F03300000000050900003 7.1 hectares TRANSNET LTD T6297/1964 Railway
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Bloemhoek 509, Theunissen RD Portion 8 F03300000000050900008 2.2 hectares DIE SUID-AFRIKAANSE NASIONALE PADAGENTSKAP LTD T1882/2019 Regional road R730
Farm Portion LPI code Overall Extent Landowner Title deed number Current land use	Doorn River 330, Theunissen RD Portion 11 unregistered (from the Remainder) F03300000000033000011 (unregistered) 7.3 hectares (Diagram Deed SG 1656/2008) SANRAL (from PIENAAR ANDRIES BENJAMIN) Unregistered - T4880/2016 (Remainder) Regional road R730
Farm	Doorn River 330, Theunissen RD

Portion	Portion 21 unregistered (from the Remainder)
LPI code	F03300000000033000021 (unregistered)
Overall Extent	369 hectares (Diagram Deed SG 478/2017)
Landowner	HUMAN JACOBUS DANIEL
Title deed number	Unregistered - T4880/2016 (Remainder)
Current land use	Grazing, game farming
Farm	Doorn River 330, Theunissen RD
Portion	Portion 6
LPI code	F03300000000033000006
Overall Extent	45 hectares
Landowner	ESKOM HOLDINGS LTD
Title deed number	T5096/1987
Current land use	Eskom Theseus substation

The land-use of the proposed development site is livestock, game and dryland maize cultivation. The surrounding areas and powerline corridor are used for cattle, game and crop cultivation.

9.4.2 ENVIRONMENTAL FEATURES

Environmental Screening Report

Table 20 Environmental Screening Tool Table

Theme	Very High	High	Medium	Low	Specialist Studies Conducted	Motivation for no Specialist Studies
	X – Solar Park	X – Power line				
Agriculture	X	X			X	
Animal species			X X		X	
Aquatic biodiversity	X			X	X	
Archaeological and Cultural Heritage				X X	X	
Avian				X	X	
Civil Aviation		X	X		X	
Defense				X X		Low sensitivity No Defense infrastructure at / near proposed development site.
Landscape	X				X	
Paleontology	X X				X	
Plant species				X X	X	
RFI				X	X	
Terrestrial Biodiversity	X X				X	

The following environmental sensitivities are identified for the project area:

- **Agriculture Theme**

Sensitivity - High land capability.

The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant land and dissected plains and is currently used for grazing and classified as partially arable. The agricultural agro-ecosystem impact assessment (Annexure K) concluded that the site should be classified as marginally suitable for arable agriculture due to its physical characteristics. Although the soil texture and depth are suitable for arable agriculture, the climatic conditions (annual rainfall 560mm) render the soils marginal for arable agriculture. The site is moderate potential grazing land, but re-growth of grass under the panels will provide for grazing by small livestock such as game and sheep.

- **Animal species Theme**

Sensitivity - Medium.

A sensitivity analyses was conducted, and no red data fauna were found. Suitable habitat of the spotted necked otter will be excluded from the development - Annexure D.

- **Aquatic Biodiversity Theme**

Sensitivity - Low for Solar Park and Very High for Power line

An impact assessment was conducted for wetlands and riparian zones on site in addition to mitigation measures recommended to ensure the protection of riverine ecosystems close to the development area. Specific mitigation measures must be implemented around riparian zones and water courses to prevent negative impacts other than impacts caused during the development. Two wetland types identified include a valley bottom wetland with channel and a depression (pans and man-made dams). PES assessment indicates that riparian zones, wetlands and water courses are 'Moderately Modified' and EIS of on-site are MODERATE and are ecologically important and sensitive – Annexure F.

- **Avian Species Theme**

Sensitivity - Low

The avifaunal impact assessment conducted (Annexure E), concluded that based on the high receptor resilience and the medium biodiversity importance, the assessment area was given low site ecological importance, with transformed areas having a very low site ecological importance (SEI). No particularly sensitive avian habitats occur on the project site and is not located in an Important Birding Area (IBA) according to Birdlife SA IBA program. The avifaunal assessment (Annexure E) concluded that very few sensitive features were identified for the project mainly along the proposed power line.

- **Civil Aviation Theme**

Sensitivity - Medium for Solar Park and High for Power Line (Between 8 and 15 km of other civil aviation aerodrome)

Evidence from the assessment and the technical drawings show clearly that the Florida Project will not interfere or impact the Obstacle Limit Surfaces and the Approach/Departure Surfaces of Harmony Mine and Beatrix Mine airports – Annexure P. An application for approval will be submitted to the Civil Aviation Authority.

- **Defence Theme**

Sensitivity - Low

- **Paleontological Theme**

Sensitivity - High

The palaeontologist concluded that it is extremely unlikely that fossils will be exposed because of the proposed development on the solar PV site as well as on the powerline route. From a palaeontological perspective the proposed PV development should proceed but, if fossils are uncovered during the development phase, the developer should immediately call a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils (Annexure H).

- **Plant Species Theme**

Sensitivity - Low

The botanist concluded that the development can be supported provided that the mitigation measures and sensitivity map are implemented – Annexure D.

- **RFI Theme**

Sensitivity - Low.

Radio Frequency Assessment minimum report attached as Annexure L.

- **Terrestrial Biodiversity Theme**

Sensitivity - Very High because it falls within CBA 1 and ESA 1 according to the National screening tool. The Free State Biodiversity Conservation Plan however has a different view of the area and assigned a low sensitivity to a large section of the development area.

According to the terrestrial Biodiversity report most of the proposed development footprints represent Degraded Areas and Other natural Areas. The management objective for this area is to maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern.

9.4.3 WIND AND SOLAR DEVELOPMENTS WITH ENVIRONMENTAL AUTHORISATION OR APPLICATIONS UNDER CONSIDERATION WITHIN 30 KM OF THE PROPOSED AREA

The following wind and solar projects, proposed with 30km from the project site, received and/or applied for Environmental Authorisation according to the DFFE database:

Table 21. List of Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of Application	Distance from the proposed area (km)
1	12/12/20/2669	Solar PV	Approved	18.1
2	12/12/20/2666/A	Solar PV	Approved	22.8
3	12/12/20/2668	Solar PV	Approved	19.4
4	14/12/16/3/3/1/1322	Solar PV	Approved	19.1
5	12/12/20/2666	Solar PV	Approved	22.8
6	12/12/20/2667	Solar PV	Approved	19.4
7	12/12/20/2668	Solar PV	Approved	19.2
8	14/12/16/3/3/2/2099	Solar PV Virginia 1 SP	Approved AWARDED IN ROUND 6 OF REIPPPP	7.5
9	14/12/16/3/3/2/2100	Solar PV Virginia 2 SP	Approved AWARDED IN ROUND 6 OF REIPPPP	9.2
10	14/12/16/3/3/2/2101	Solar PV Virginia 3 SP	Approved AWARDED IN ROUND 6 OF REIPPPP	9.4

Table 22. List of Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Project Name	Project Capacity [MW]	Date of application
1	12/12/20/2669	Proposed Construction of PV Solar Facility and Associated Infrastructure on Portion 225 of Farm Kalkoenkrans, Beatrix Mine Shaft 4, Oryx Mine in Virginia, Free-State Province	20	2012/08/14
2	12/12/20/2666/A	Construction of the 19.9MW PV Facility for the Generation of Electricity on Portion of Farm Palmietkuil 328, Beatrix Mine Shaft 4, Oryx Mine in Virginia, Free State Province.	19.9	2013/08/12
3	12/12/20/2668	Proposed development and implementation of solar panels (solar photovoltaic project 221) for electricity generation on portion of the farm Leeubult 52 Beatrix Mine Shaft 2, Virginia, Free State	19.9	2012/08/14

No	EIA Reference No	Project Name	Project Capacity [MW]	Date of application
4	14/12/16/3/3/1/1322	Proposed construction of Hennenman 5 mw Solar Energy Facility, near Hennenman, Free State	5	2014/11/07
5	12/12/20/2666	Proposed development and implementation of solar panels (solar photovoltaic project 221) for electricity generation on portion of the farm Leeubult 52 Beatrix Mine Shaft 2, Virginia	19.9	2012/08/14
6	12/12/20/2667	Proposed development and implementation of solar panels (solar photovoltaic project 221) for electricity generation on portion of the farm Leeubult 52 Beatrix Mine Shaft 2, Virginia	19.9	2012/08/14
7	12/12/20/2668	Proposed development and implementation of solar panels (solar photovoltaic project 221) for electricity generation on portion of the farm Leeubult 52 Beatrix Mine Shaft 2, Virginia	19.9	2012/08/14
8	14/12/16/3/3/2/2099	Renewable Energy Generation Project on the Farm Blomskraal 216, Ventersburg Rd, located in the Matjhabeng Local Municipality AWARED IN ROUND 6 OF REIPPPP	100	2022/02/01
9	14/12/16/3/3/2/2100	Renewable Energy Generation Project on the Farm Blomskraal 216, Ventersburg Rd, located in the Matjhabeng Local Municipality AWARED IN ROUND 6 OF REIPPPP	100	2022/02/01
10	14/12/16/3/3/2/2101	Renewable Energy Generation Project on the Farm Blomskraal 216, Ventersburg Rd, located in the Matjhabeng Local Municipality AWARED IN ROUND 6 OF REIPPPP	100	2022/02/01

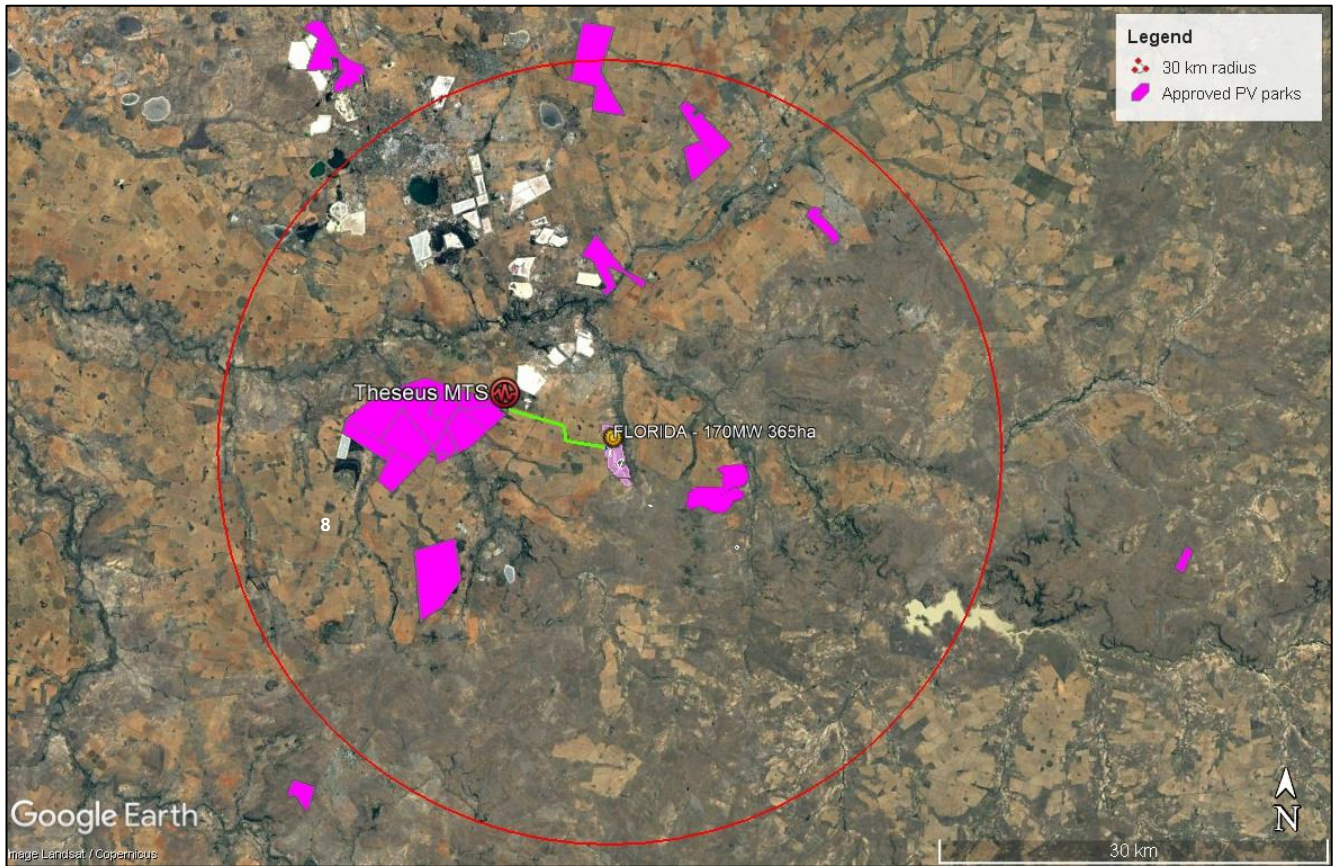


Figure 11. Map of Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

During the last Round 6 of the REIPP Procurement Programme, **240 MW** has been already allocated to the Virginia 1, 2 and 3 Solar Parks, located on the farm Blomskraal 216, Ventersburg RD of 4246 ha).

The construction phase of the Virginia 1, 2 and 3 projects, within a footprint of approximately **480 ha**, is planned to be started at the beginning of 2024.

With reference to the other projects listed in the tables above, it should be noted that **none of them, applied for, have been built so far.** A number of these applications have lapsed or have been withdrawn. No additional information has been found about these solar projects.

With reference to the wind and solar projects currently under development in the proximity of the proposed Florida Solar Park, the following solar photovoltaic projects / Environmental Authorisation processes are on-going:

Table 23. List of Solar developments with an on-going Environmental Authorisation process under consideration within 30 km of the proposed area

No	EIA Reference No	Project name (project capacity) and applicant	Status of Application	Distance from the proposed area
1	14/12/16/3/3/2/2299	Quagga Solar Park (240 MW) Indus Energy (Pty) Ltd	Draft EIA submitted	10.9 km
2	14/12/16/3/3/2/2297	Corona Solar Park (240 MW) Corona Energy (Pty) Ltd	Draft EIA submitted	4.5 km
3	14/12/16/3/3/2/2283	Virginia 4 Solar Park (170 MW) Lupus Energy (Pty) Ltd	Draft EIA submitted	9.8 km

Please refer to the **Locality Map** and to the **Cumulative Map**, attached as Annexure A, showing the location of the Florida Solar Park with respect to the **Virginia 1, 2 and 3 Solar Parks** (construction planned in 2024) and to the **Virginia 4, Quagga and Corona Solar Parks** (Environmental Authorisation process ongoing).

9.4.4 CLIMATE

The climate for the region can be described as warm-temperate. In terrestrial environments, limitations related to water availability are always important to plants and plant communities. The study area is situated within the summer and autumn rainfall region with very dry winters and frequent frost that occurs during the colder winter months.

The mean annual precipitation for the region is around 560mm. The mean annual temperature for the area is 15.2°C, and the mean annual frost days is 43 days. Mean Annual Potential Evaporation is 2226mm, with Mean Annual Soil Moisture Stress of 78%.

9.4.5 TOPOGRAPHY AND DRAINAGE

The study area lies completely within the Middle Vaal Water Management Area (WMA) and entirely within the Highveld ecoregion (Kleynhans et al., 2005).

The topography is characterised by slightly undulating plains with wetlands and / or drainage channels bisecting the area. The topography of the site can be described as generally favourable, when considering that most of the area consists of slopes of less than 1:5. The site is located at an altitude of between 900 and 940 meters above mean sea level (AMSL).

Most properties situated within a 500m radius are being used for livestock and crop cultivation. The proposed development land is used for livestock farming and maize cultivation at present. The natural vegetation of the site is mostly intact.

The site is located within the C42H quaternary catchment within the Middle Vaal Water Management Area. Drainage occurs as sheet-wash into the drainage channels on site that eventually drains into the Merriespruit, a tributary of the Sand River.

9.4.6 GEOLOGY & SOILS

The entire area is underlain by very fine to coarse grained, buff white and white sandstone, blue grey mudstone and shale with subordinate conglomerates of the Adelaide Subgroup (Pa), the upper unit of the Beaufort Group, Karoo Sequence. An intrusive dolerite sill (Jd) that intruded horizontally between the sandstone layers of is exposed through weathering in the central portion of the project area.

Overlying the sandstone is aeolian sand (Qs) and calcretized sand deposits along drainage courses.

The intrusive dolerite sills (Jd) are similar in character to the basalts of the Lesotho Highlands but are generally younger than the basalts and were emplaced during the waning stages of the Drakensberg Volcanics.

The soils were classified into broad classes according to the dominant soil form and family as follows:

- Red-yellow apedal soils of the Hutton soil forms.
- Red-yellow apedal soils of the Avalon / Clovelly soil form.
- Yellowish sandy clay soils of the Oakleaf soil form.
- Greybrown clayey soils of the Valsrivier / Katspruit / Rensburg soil forms.

The geological formations and vegetation patterns showed a strong correlation to the major soil units mapped in the study area.

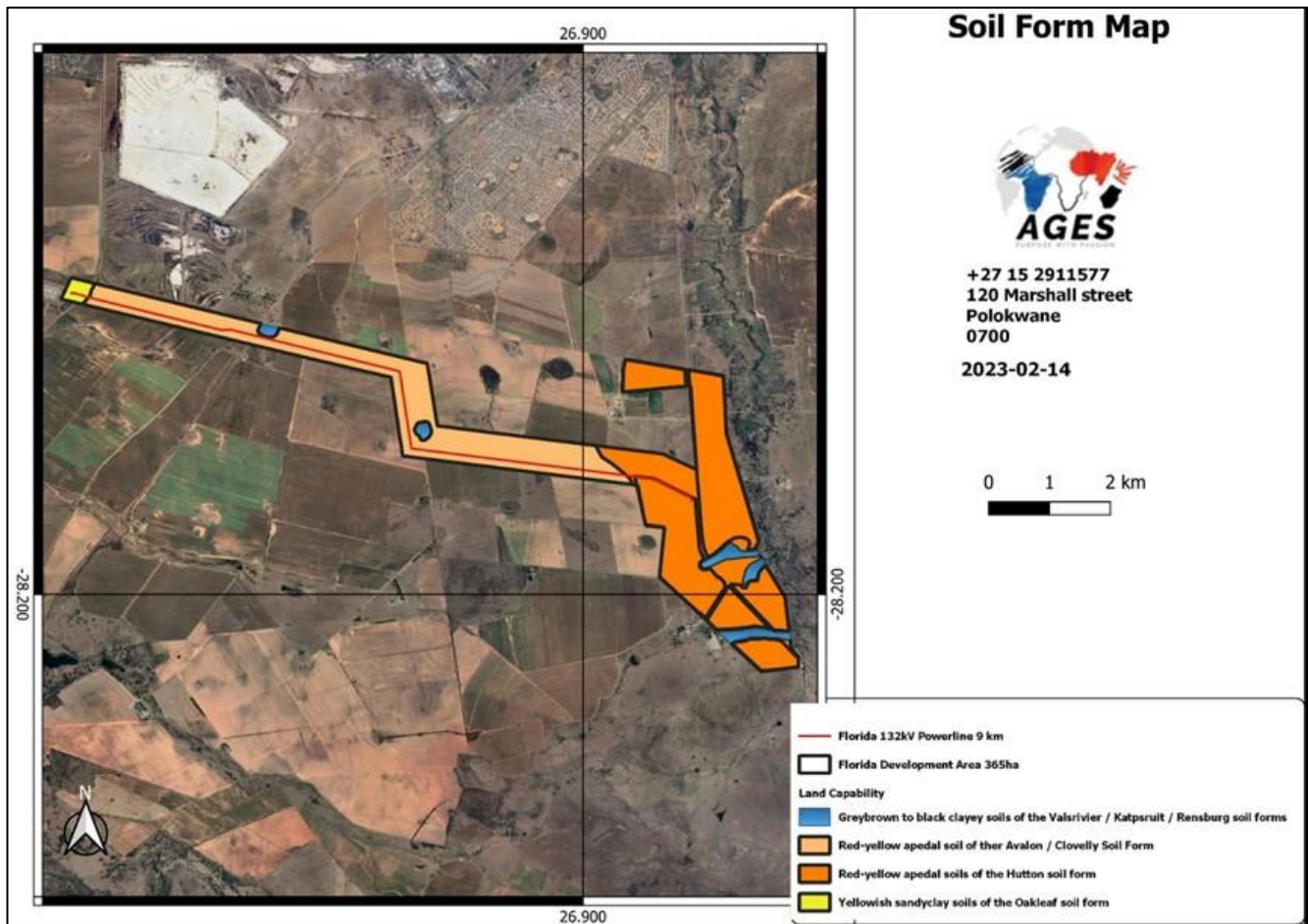


Figure 12. Soil Form Map

9.4.7 GEOTECHNICAL REPORT

A desktop geotechnical assessment was done, and the report is attached as Annexure I. The following conclusions were made by the specialist:

- No geosites have been identified on the site.
- Due to the climate shallow bedrock conditions is expected.
- Four soil profiles are expected on site:
 - Profile 1 – Transported aeolian sand overlying weathered sandstone
 - Profile 2 - Calcretized deposits close to drainage features
 - Profile 3 - Weathered Karoo sandstone.
 - Profile 4 - Weathered Dolerite.
- The potential for collapse of side walls of deep excavations is low.
- No shallow groundwater conditions are expected.
- The calcareous soils present on the site may be useful as road construction material.
- Normal strip footing foundations recommended for buildings.
- Pre-bored rammed piles or pre-bored cast in situ piles are recommended for the single axis tracker systems planned.
- The geotechnical risk classification for the project area is F2 due to the shallow bedrock and excavatability risk for profiles 2 and 3. Profile 1 is potentially collapsible. Profile 1 is suitable for development.

- Localized soil degradation and erosion is the only environmental impacts identified for the property.
- Considering geotechnical aspects, the proposed development area is suitable for the proposed development of a PV solar facility if these recommendations are adhered to as a minimum requirement.
- The existing borrow area will require rehabilitation before the installation of the PV arrays.
- Geophysical surveys to define the soil resistivity at the proposed substation position and thermal resistivity along the cable routes are recommended.
- Assessment of the potential direct and indirect environmental impacts resulting from the geological and geotechnical conditions on site.

Considering geotechnical aspects, the proposed development area is suitable for the proposed development of a PV solar facility if these recommendations are adhered to as a minimum requirement.

9.4.8 ECOLOGY (FAUNA & FLORA)

A Terrestrial Biodiversity Impact Assessment (Annexure D) was conducted by Dr BJ Henning to describe the ecology (fauna and flora) present in the site, to assess its ecological sensitivity and to indicate the most suitable areas for the proposed development.

A pre-screening site visit was therefore conducted to determine if the assessment was accurate and if the studies recommended should be conducted. After the site visit the following was concluded:

- The site has a HIGH Sensitivity from a terrestrial biodiversity perspective due to the presence of indigenous grassland with wetlands.
- The site has a Medium Sensitivity from an Animal Species Theme Perspective due to the presence of natural fauna habitats.
- The site has a Medium Sensitivity from a Plant Species Theme Perspective due to the presence of indigenous grassland.

After the assessment, it was concluded that a detailed terrestrial biodiversity, plant species theme and animal species theme assessment should be conducted.

For this purpose, detailed ecological (fauna habitat & flora) surveys were conducted during November 2022 to identify specific fauna habitats, and to compare these habitats with habitat preferences of the different fauna groups (birds, mammals, reptiles, amphibians) occurring in the quarter degree grid.

9.4.8.1 Vegetation types

The most recent classification of the area by Mucina & Rutherford (2006) shows that the site is classified as Central Free State Grassland, Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland.

The landscape of the Central Free State Grasslands is characterised by undulating plains supporting short grassland. Under natural conditions it is dominated by *Themeda triandra* but is dominated by *Eragrostis curvula* and *E. chloromelas* in disturbed habitats. Dwarf Karoo-shrubs establish in severely degraded clayey bottomlands and overgrazed and trampled low-lying areas are prone to *Vachellia karroo* encroachment. From a conservation point of view, this unit is described as Least Concern. Almost a quarter of the area of it being transformed for crop cultivation and building of large dams such as Allemanskraal, Erfenis, Groothoek, Koppies, Weltevrede and Kroonstad Dams. Small portions are conserved in the Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves as well as in some private nature reserves.

The Vaal-Vet Sandy Grasslands vegetation unit is described as plains-dominated landscape with some scattered slightly irregular undulating plains and hills. Mainly low tussock grasslands with an abundant karroid element. *Themeda triandra* is dominant in this vegetation unit. This vegetation type is described as Endangered because approximately 63% of it has been transformed for commercial crop cultivation and grazing pressure from cattle and sheep. Only 0.3% of this vegetation type is statutorily conserved in Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolwespruit and Soetdoring Nature Reserves.

Highveld Alluvial Vegetation is distributed in Free State, Northwest, Mpumalanga and Gauteng Provinces, Lesotho and Swaziland where it occurs along alluvial drainage lines and floodplains along rivers embedded within the Grassland Biome. Vegetation in the Highveld Alluvial Vegetation is characterised by flat topography supporting riparian thickets mostly dominated by *Vachellia karroo*, accompanied by seasonally flooded grassland and disturbed herb lands often dominated by alien plants. Highveld Alluvial Vegetation is classified as Least Threatened, with a conservation target of 31%. Only nearly 10% of the vegetation type is statutorily conserved in Barberspan (a Ramsar site), Faan Meintjies, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves. More than a quarter has been transformed for cultivation and by building of dams (Bloemhof, Erfenis, Krugersdrif, Mockes and Vaalharts Dams). Highveld alluvia are prone to invasion by several weeds, encouraged by the high nutrient status of the soils and ample water supply. Undergrowth of alluvial riparian thickets and the accompanying grasslands suffer from heavy overgrazing in many places (Mucina & Rutherford, 2006).

The proposed development site occurs on a landscape that varies from slightly undulating to flat plains bisected by drainage channels and wetlands. The importance to survey the area to have a better understanding of the ecosystem and potential impact of the solar development on the natural environment was identified as a key factor, and subsequently the footprint areas was completely surveyed. The site forms part of larger farms used for livestock farming and maize cultivation. The vegetation units on the site vary according to soil characteristics, topography, and land-use. Vegetation units were identified on the footprint development sites and can be divided into 7 distinct vegetation units according to soil types and topography.

The vegetation communities identified on the proposed development site are classified as physiographic physiognomic units, where physiognomic refers to the outer appearance of the vegetation, and physiographic refers to the position of the plant communities in the landscape.

The physiographic-physiognomic units will be referred to as vegetation units in the following sections. These vegetation units are divided in terms of the land-use, plant species composition, topographical and soil differences that had the most definitive influence on the vegetation units. Each unit is described in terms of its characteristics and detailed descriptions of vegetation units are included in the following section.

The following vegetation units were identified during the survey:

- *Themeda triandra* – *Aristida congesta* secondary grassland
- Open *Vachellia karroo* woodland
- Degraded grassland
- Cultivated land
- Exotic bushclumps
- Old slimes dams
- Drainage features:
 - Non-perennial channels
 - Exorheic depressions (dams)
 - Endorheic depressions (pans)

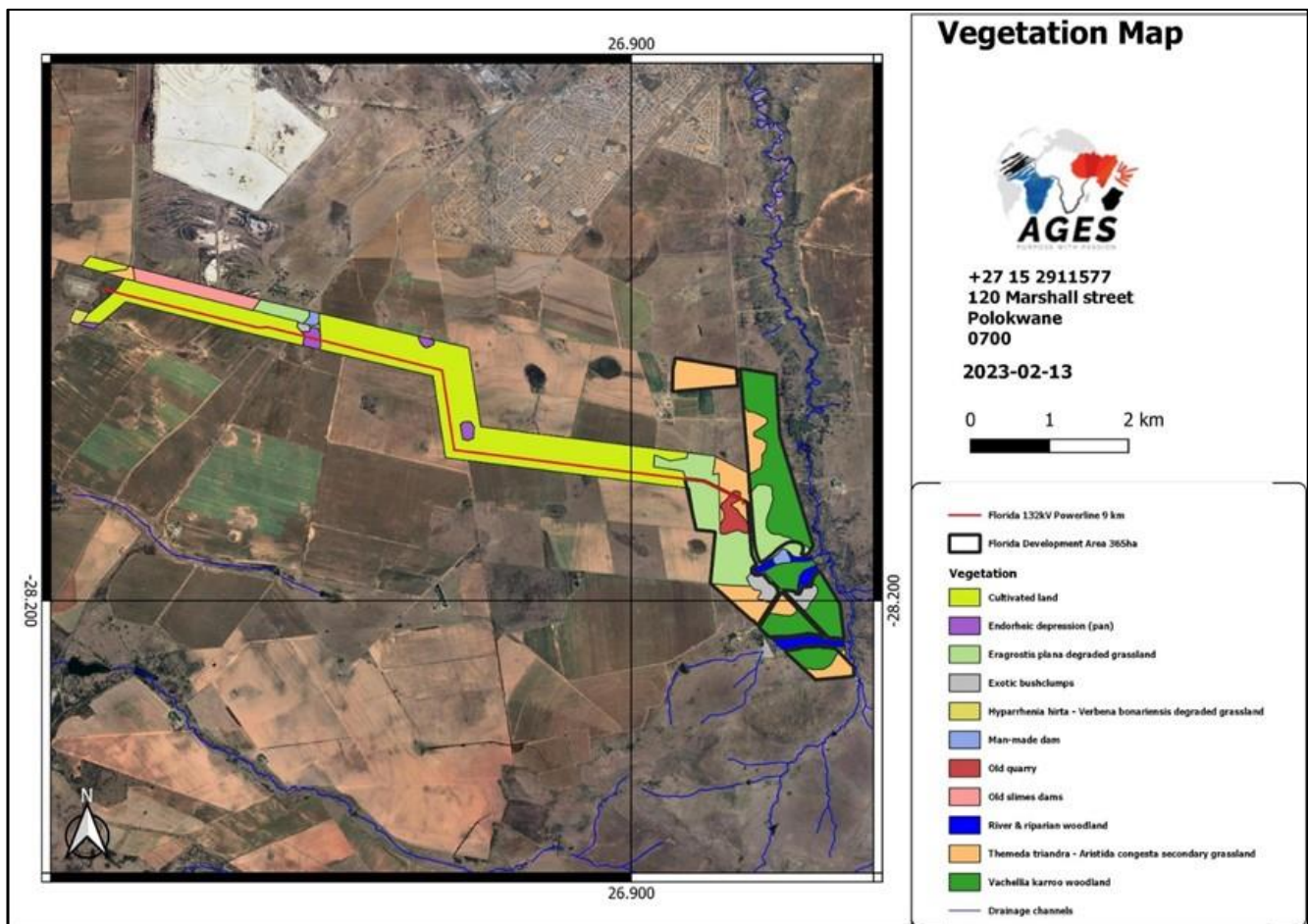


Figure 13. Vegetation Unit Map of the proposed development area (from Terrestrial Biodiversity report)

- ***Themeda triandra* – *Aristida congesta* secondary grassland**

This vegetation unit occurs on red Hutton soils in the low-lying areas adjacent to the Merriespruit. The vegetation was probably overgrazed in the past that caused the soil to become eroded. The grass layer is in a secondary state of succession at present and dominated by species such as *Themeda triandra*, *Aristida congesta* and *Sporobolus africanus*. The following specific recommendations for the vegetation unit regarding the proposed development should be adhered to:

- The vegetation unit is classified as having a **medium-low sensitivity** due to the secondary state of succession and degradation evident in the area.
- The removal of protected plant species *Boophane* or *Helichrysum* species would need a permit from local authorities in the Free State.
- The development of the solar development is considered suitable in this area.

- **Open *Vachellia karroo* woodland**

The microphyllous woodland vegetation unit occurs on red apedal soils of the Hutton soil form. The woody layer is dominated by species such as *Vachellia karroo*, *Vachellia tortilis* and *Ziziphus mucronata*. The woody structure varies from open woodland to slightly denser woodland with bushclumps in some areas. The grass layer is in a slightly degraded state due to previous overgrazing and dominated by *Setaria incrassatae*, *Themeda triandra* and *Panicum maximum*.

The following specific recommendations for the vegetation unit regarding the proposed development should be adhered to:

- The vegetation unit is classified as having a **medium sensitivity** due its widespread occurrence in the Grassland Biome.
- The development of the solar development is considered suitable in this area.

- **Degraded grassland**

A section of the proposed development footprint represents degraded grassland on red-yellow apedal soils of the Hutton soil form or Clovelly soil form. According to the soil types and previous land use, the vegetation represents degraded grassland (primary old fields) dominated by *Cynodon dactylon* and *Eragrostis plana*. The grass layer is well developed and dominated by species such as *Hyparrhenia hirta*, *Cynodon dactylon*, *Eragrostis plana*, *Eragrostis chloromelas* and various exotic weeds such as *Verbena bonariensis*.

The following specific recommendations for the vegetation unit regarding the proposed development should be adhered to:

- The vegetation unit is classified as having a **low sensitivity** due the degraded state of the herbaceous layer.
- The development of the solar development is considered suitable in this area.

- **Cultivated land**

The croplands in the project area form ploughed fields on sandy soils. Exotic weeds and pioneer grasses often colonize the areas surrounding the croplands.

- **Exotic bushclumps**

A small section of the project area is characterised by homogenous stands of exotic trees such as *Eucalyptus camaldulensis*. Exotic weeds and pioneer grasses often colonize the areas surrounding these bushclumps. This area has a **low sensitivity**.

- **Old slimes dams**

The western section of the power line is partially along completely degraded old slimes dams. This area is not active any longer and the area colonised by various alien invasive species such as Tamarisk chinensis and other exotic weeds. Due to the completely modified state of the vegetation the area has a **low sensitivity**.

- **Drainage features (non-perennial drainage channels, exorheic and endorheic depressions)**

All rivers and streams with their associated riparian vegetation in the project area are ecologically sensitive, forming important, limited, and specialised habitats for several plant and fauna species. The species composition is unique and relatively limited in distribution and coverage. These habitats also form linear corridors linking different open spaces. The drainage channels of the project area eventually flow into the Sand River that occurs to the North-east of the project area.

The non-perennial drainage channels are characterized by a channel that cuts through a slightly undulating landscape. The non-perennial riverine areas form to narrow channels. The riverine areas support low riparian woodland dominated by species such as *Vachellia karroo* and various grasses such as *Setaria sphacelata*, *Themeda triandra*, *Sporobolus africanus* and *Eragrostis rotifer*. The following recommendations should be adhered to for all drainage features:

- The vegetation is mostly in a natural habitat, with all areas in the wetland zone or drainage channels classified as a high sensitivity area with a high conservation priority, while natural vegetation outside the floodline is natural woodland with a Medium Sensitivity. No alteration of these important drainage areas is recommended. A 32-meter buffer should be implemented around the riparian zones of the smaller drainage channels and wetlands on site.
- A Water Use Licence application should be submitted to the Department of Water and Sanitation for the development of the solar plants within 500 meter of the wetland zones or the floodline zones of non-perennial drainage channels.
- Only existing roads should be used to cross drainage lines, and mitigating measures should be implemented to prevent erosion of roads across drainage lines.

9.4.8.2 Red Data Species

No red data species were documented during the surveys in the study area. Ecological monitoring should however still be implemented during the construction phase and specific sensitive habitats (riparian) needs to be avoided to ensure that any potential red data species potentially missed during the field surveys are preserved and not potentially impacted on.

9.4.8.3 Protected Species (Free State Nature Conservation Ordinance)

Plant species are also protected in the Free State Province according to the Free State Nature Conservation Ordinance. According to this ordinance, no person may pick, import, export, transport, possess, cultivate, or trade in a specimen of a specially protected or protected plant species. The Appendices to the ordinance provide an extensive list of species that are protected, comprising a significant component of the flora expected to occur on site. Communication with Provincial authorities indicates that a permit is required for all these species if they are expected to be affected by the proposed project.

After a detailed survey was conducted during November 2022, the listed species *Boophane disticha* and *Helichrysum nudifolium* confirmed for the site. The species can be relocated from its current locations if needed through a rescue and relocation programme should the development activities impact on populations.

9.4.8.4 Protected Trees Species (NFA)

The National Forest Act,1998 (Act No.84 of 1998) provides a list of tree species that are considered important in a South African perspective because of scarcity, high utilization, common value, etc. In terms of the National Forest Act of 1998, these tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by DFFE (or a delegated authority). Obtaining relevant permits are therefore required prior to any impact on these individuals. Taking cognizance of the data obtained from the field surveys, **no protected tree species** occur in the area.

9.4.8.5 Alien Invasive Species

The following alien invasive and exotic plant species were recorded on site during the surveys as stipulated in the Alien and Invasive Species Regulations (GNR 599 of 2014).

Table 24. Declared weeds and invader plants of the study area.

Species	Category
<i>Argemone ochroleuca</i>	1b
<i>Cestrum laevigatum</i>	1b
<i>Datura stramonium</i>	1b
<i>Eucalyptus camaldulensis</i>	1b

Species	Category
<i>Morus alba</i>	3
<i>Opuntia ficus-indica</i>	1b
<i>Opuntia imbricata</i>	1b
<i>Tamarisk chinensis</i>	1b
<i>Verbena brasiliensis</i>	1b
<i>Xanthium strumarium</i>	1b

According to the amended regulations (No. R280) of March 2001 of the Conservation of Agricultural Resources Act 1983 (Act no. 43 of 1983), it is the legal duty of the land user/landowner to control invasive alien plants occurring on the land under their control.

9.4.8.6 Ecological Sensitivity Classification of area

Following ecological surveys, classification of the study area into different sensitivity classes and development zones was based on information collected at various levels, factors which determined sensitivity classes were as follow:

- Presence, density, and potential impact of development on rare, endemic, and protected plant species.
- Conservation status of vegetation units.
- Soil types, soil depth and soil clay content.
- Previous land-use.
- State of the vegetation in general as indicated by indicator species.

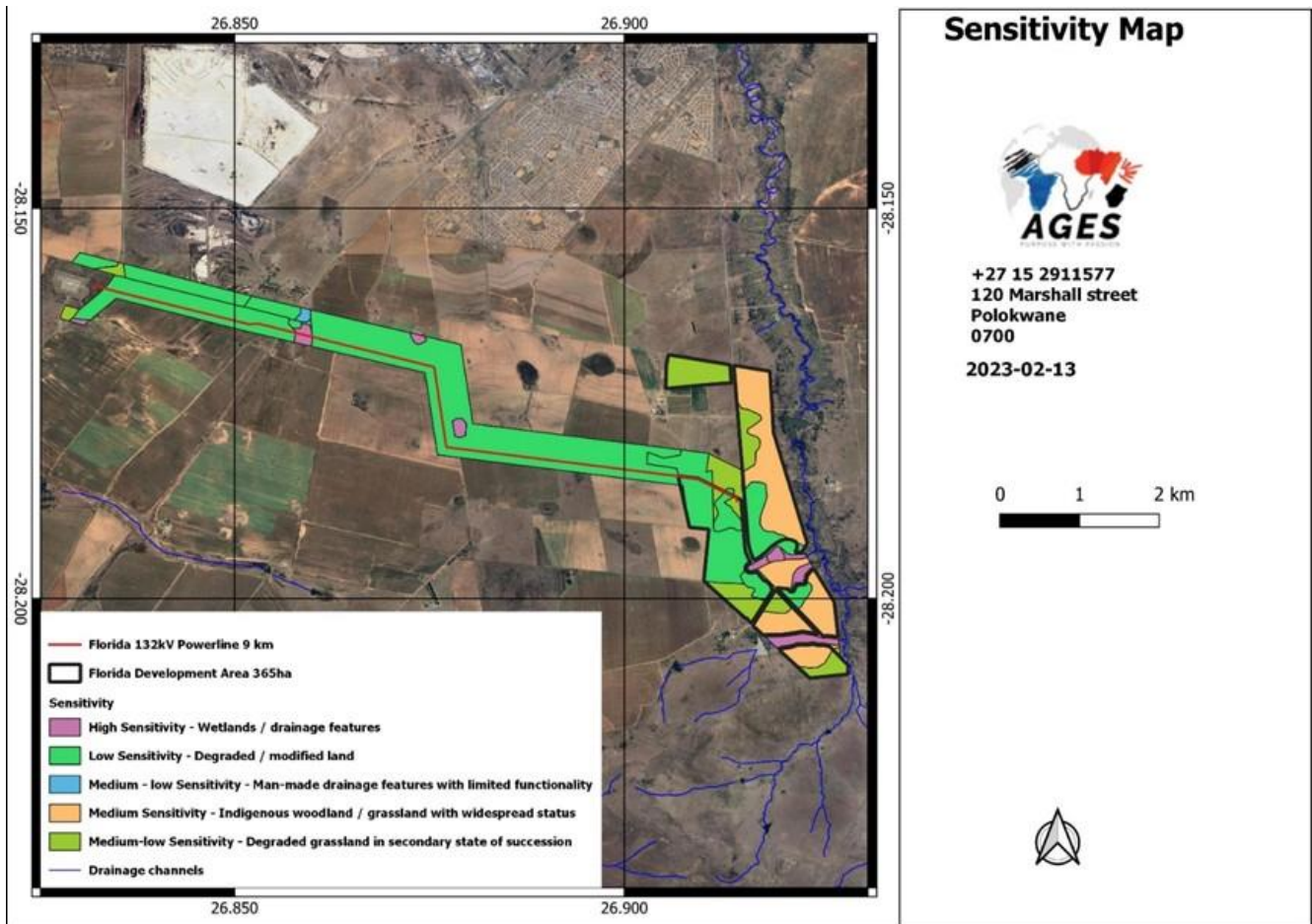


Figure 14. Ecological Sensitivity Map

9.4.8.7 Conclusions

The importance of rehabilitation and implementation of mitigation processes to prevent negative impacts on the environment during and after the construction phase of the solar development should be considered a high priority. The proposed site for the development varies from being in a completely modified to slightly degraded state.

The protected plant species *Boophane disticha* and *Helichrysum nudifolium* occur on the site and specific mitigation measures (permit applications, avoidance, relocation) should be implemented to avoid negative impacts on the species.

9.4.8.8 Fauna

A survey was conducted during November 2022 to identify specific fauna habitats, and to compare these habitats with habitat preferences of the different fauna groups (birds, mammals, reptiles, amphibians) occurring in the quarter degree grid. During the site visits mammals, birds, reptiles, and amphibians were identified by visual sightings through random transect walks. In addition, mammals were also recognized as present by means of spoor, droppings, burrows or roosting sites.

9.4.8.8.1 Mammals

The Highveld Ecoregion contains a higher number of mammals, although only the orange mouse (*Mus orangiae*) is restricted to the ecoregion, and the rough-haired golden mole (*Chrysospalax villosa*) is near-endemic. The ecoregion also supports populations of several large mammal species, some of which are rare in southern Africa (Stuart and Stuart 1995). Among these are the brown hyena (*Hyaena brunnea*), African civet (*Civettictis civetta*), leopard (*Panthera pardus*), pangolin (*Manis temminckii*), honey badger (*Mellivora capensis*), striped weasel (*Poecilogale albinucha*), aardwolf (*Proteles cristatus*), oribi (*Ourebia ourebi*), and mountain zebra (*Equus zebra hartmannae*).

Predators that still roam freely in the area include larger predators such brown hyena, while smaller predators such as caracal, serval and honey badger are common throughout the larger area. Antelope species such as duiker and steenbok will roam freely through the area and are not restricted by game fences. Smaller mammal species such as honey badgers and serval can become habituated to anthropogenic influences, while other species such as brown hyena will rather move away from the construction activities and will seldom use the area.

Spotted-necked otters (listed by the EIA screening tool) are aquatic and require permanent and continuous waterways. They prefer clear water with rocks. They are found in lakes, swamps, rivers, and may be found in mountain streams at higher elevations. They are absent in turbid rivers and shallow alkaline lakes. They live in dens, which are found near these sources of water.

The otter's fur is highly prized, being used as a cure for eye and/or nose infections. The spotted-necked otters are in decline due to changes in their environment and human interference. One problem is the increased use of nylon fishing nets, in which the otters get tangled in and die. Erosion of soil near the source of the rivers is also a threat. Fish-farmers and fur-trappers are also playing a part in the decline of the spotted-necked otter.

Probability of occurrence on site: MODERATE due to the presence of suitable habitat on the proposed development footprint, although no population of the species occur on site.

Probability of impact during vegetation clearance: MODERATE, no populations documented although some habitat considered suitable at wetland crossings and dams.

The connectivity 1 of the project site to the remainder of the larger area is Moderate due to other surrounding areas representing natural grassland and wetlands. Of significance is the role of the wetlands and indigenous grasslands as zoogeographical dispersal corridors.

Most mammal species are highly mobile and will move away during construction of the solar development. The most important corridors that need to be preserved for free-roaming mammal species in the area include the wetlands and indigenous grasslands.

9.4.8.8.2 Avifauna

¹ **Connectivity (habitat connectivity)** - Allowing for the conservation or maintenance of continuous or connected habitats, so as to preserve movements and exchanges associated with the habitat.

An Avifaunal Assessment (Annexure E) was conducted by Ryno Kemp (*Pr.Sci.Nat.*) to determine whether the proposed development would have negative impact on avifauna.

One hundred and twenty-nine (129) bird species were recorded in and around the project area of influence, with 95 species recorded from point counts and an additional 34 species recorded as incidental sightings. The field survey was conducted on 12 -15 December 2022.

The assessment area consisted of four avifauna habitats; transformed areas, degraded grassland, grassland and bushclumps. These habitats were mainly in a natural state except for the regions disturbed by livestock grazing and transformed due to anthropogenic activities. Three species of conservation concern were confirmed in the assessment area (Blue Korhaan (*Eupodotis caerulescens*), Lanner Falcon (*Falco biarmicus*) and Secretarybird (*Sagittarius serpentarius*). Some high-risk avifauna species were recorded from the project area and surrounding, including raptors and water birds.

The project will result in habitat loss and degradation of avifaunal habitats. The development will lead to the clearing of vegetation and an alteration in the undeveloped nature of the area. Based on the high receptor resilience and medium biodiversity importance, the assessment area was given low site ecological importance, with transformed areas having a very low site ecological importance (SEI). Although, the overall sensitivity is considered low, the specialist strongly suggests a follow-up survey to confirm the low sensitivity at the end of the wet season.

The development will also lead to sensory disturbance, collision and electrocution risks. Even though the latter three impacts can be effectively mitigated, the loss of habitat cannot be mitigated. Considering the number of applications and current solar plant developments in the area the cumulative impact is regarded as being high.

The mitigation hierarchy implemented in this report is based on section 2(4)(a)(i) of NEMA and the policy on Environmental offsetting (Biodiversity Offset Guidelines, section 24(J) of NEMA, Sept 2021). The mitigation hierarchy includes first avoiding the impact, then minimising it, then rehabilitation, and then offsetting. Where a residual impact, even after mitigation, is high, then offsetting must be considered. In this case, no impacts are high post-mitigation and according to available data, offsets will not be required. Mitigation measures have reduced most impacts to a Moderate or Low, which is considered within the limits of acceptable change.

The significance of potential impacts on avifauna are assessed in Tables 7-1 to 7-4 of the Avifaunal Assessment.

Mitigation measures are included in Table 8-1 of the Avifaunal Assessment and the EMPr.

Considering the above-mentioned information, very few sensitive features were identified for the project mainly along the proposed power line. It is the opinion of the specialist that the

project may be considered for approval, but all prescribed mitigation measures and monitoring must be considered by the issuing authority.

Bird diverters, bird guards, and spirals must be placed along the entire proposed powerline to reduce fatalities, as these large terrestrial birds and raptors do occur across the entire proposed powerline. Any power lines that may be developed must be extensively mitigated.

Cumulative Impacts

Cumulative impacts are assessed in context of the extent of the proposed assessment area; other developments in the area; and general habitat loss and transformation resulting from other activities in the area.

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project’s impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a point in time may represent a significant change from the original state of the system. This section describes the potential impacts of the project that are cumulative for avifauna.

Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers (such as nearby solar farm activities within the area). These include dust deposition, noise and vibration, disruption of corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

Based on the number of known and planned PV sites and their associated powerlines in the area the cumulative impact is expected to be moderate. These would collectively result in a large area of habitat loss, and it increases the risk of collisions and electrocutions for avifauna. This risk is especially high as a few species expected and recorded is in a high-risk category for collisions and electrocutions.

A total area of 30 km surrounding the project area was used to assess the total habitat loss in the area and subsequently the cumulative impact. To determine the intact remnant habitat the NBA (2018) remnant spatial data was utilised. The future renewable energy projects were also considered by utilising the REEA Q3 (2022) spatial dataset. To remove any duplication, only the areas that overlap with the remnant areas were considered. The total cumulative loss was found to be 46.3% (**Error! Reference source not found.**), and a visual representation of this is shown in Figure 17.

Table 25. Total cumulative habitat loss

Total Area of 30 km buffer	Intact Remnant Habitat	REEA area that overlaps with undisturbed areas	Total Disturbed/Transformed habitat	Percentage area lost
282 265 ha	149 324 Ha	11 544 Ha	119 379 Ha	46.3 %

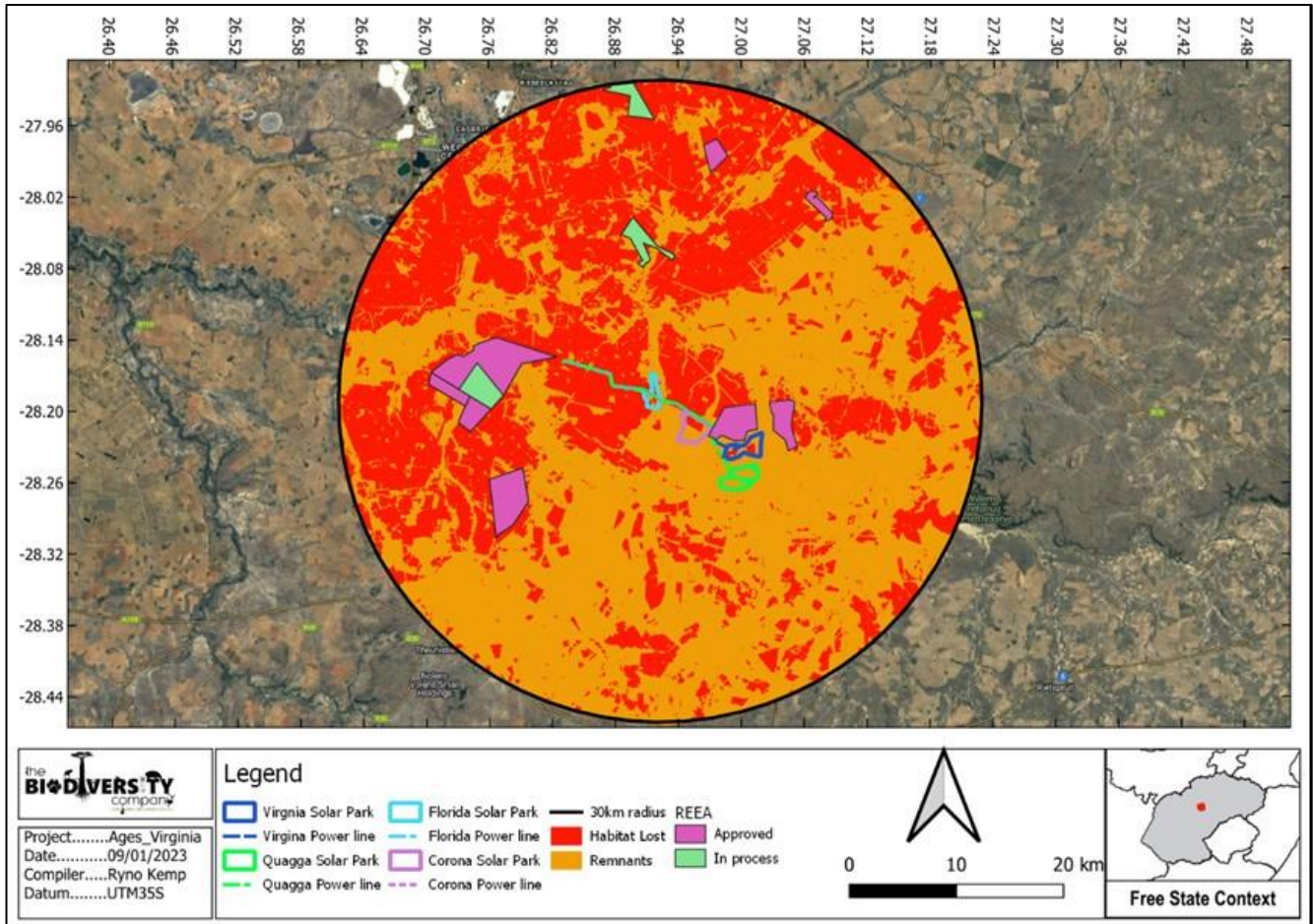


Figure 15. Cumulative habitat loss in the area

9.4.8.8.3 Herpetofauna

Twenty-nine amphibians occur within the ecoregion, but none are endemic (Passmore and Carruthers 1995). Breeding habitat of frogs and toads can be found mostly in the permanent wet zone of the wetlands and dams in the larger area. Amphibian species potentially occurring in the larger area include Common River Frog, Natal Sand Frog, Gutteral Toad, Raucous Toad and Bubbling Kassina. These species are non-threatened and widespread, and as such the development will not have any impact on amphibian conservation within the region.

Relatively few reptile species occur within the Highveld Ecoregion, mainly due to its cool climate. However, the ecoregion supports some of Africa’s most characteristic reptile species, including Nile crocodile (*Crocodylus niloticus*), African rock-python (*Python sebae*), water monitor (*Varanus niloticus*) and veld monitor (*Varanus exanthematicus albigularis*). There are also two strict endemic reptiles: giant girdled lizard (*Cordylus giganteus*), and *Agama distanti* (Branch 1998). Several additional reptile species are near endemics, including Drakensberg rock gecko (*Afroendura niravia*), giant spinytail lizard (*Cordylus giganteus*), and Breyer's whiptail (*Tetrodactylus breyeri*) (Branch 1998).

In the presence of dead termitaria, the small geckos listed are probably found on the site. A few terrestrial lizards (Yellow-throated Plated Lizard, Variegated Skink), typical for Highveld Grassveld, are expected to be present. A variety of smaller snake species characteristic for Highveld Grassveld will be present (Common Wolf Snake, Brown House Snake), although some might be dependent on by the presence of dead termitaria. The only venomous snakes, which has been reported as being present and common, is as expected, the Rinkhals, Mozambique spitting cobra, snouted cobra and the Puffadder for this QDS. All the reptile species are common and widespread, and as such the development will not have any impact on reptile conservation within the region. The sungazer lizard occurs in some of the grassland areas, while the southern spiny agama and the striped harlequin snake may occur in small numbers in suitable habitat.

Table 26. Red data list of potential fauna for the study area

English Name	Conservation Status	Probability of occurrence on site
BIRDS		
Stork, Abdim's	Near Threatened	Moderate
Stork, Yellow-billed	Endangered	Moderate
MAMMALS		
Oribi	Endangered	Low
Roan Antelope	Endangered (2016)	Zero – restricted to game reserves
African wild dog	Endangered (2016)	Zero – restricted to game reserves
Vaal Rhebok	Near Threatened (2016)	Low
Southern African Hedgehog	Near Threatened (2016)	Moderate
Lechwe	Near Threatened (2017)	Zero – restricted to game reserves
(Southern African) Tsessebe	Vulnerable (2016)	Zero – restricted to game reserves
Sable antelope	Vulnerable (2016)	Zero – restricted to game reserves
Ground Pangolin	Vulnerable (2016)	Low
African White-tailed Rat	Vulnerable (2016)	Moderate
Hartmann's Mountain Zebra	Vulnerable A3bcd (IUCN, 2019)	Zero – restricted to game reserves
HERPETOFAUNA		
Giant Bull Frog	Near Threatened	Moderate
Giant Girdled Lizard	Vulnerable (SARCA 2014)	Low

Negative impacts of the proposed development will have a medium to low impact on fauna of the area. Recommendations and mitigating measures still need to be implemented to ensure the survival of these species, other fauna habitats and feeding grounds as stipulated below:

- The development would not have a significant impact on the above-mentioned red data fauna since adequate and natural habitat/vegetation would be available on the peripheral grassland habitats surrounding the development site. The most probable

habitat to find any of the red data species in the study area would be in the more natural areas of the grassland and wetlands where little or no disturbances from humans or livestock occur at a regular interval. Fauna will therefore rather move away from the area and utilize adjacent, more natural areas. The importance to preserve the wetland habitats to the north and south of the development footprint should still be considered a high priority though.

- The removal of vegetation should be confined to the footprints of the proposed development site. This will be on small sections in relation to the total available surrounding habitat for fauna. Development also will not influence the natural feeding and movement patterns of the existing fauna in the area.
- If one considers the habitat descriptions of the red data species, most of them are not directly threatened by habitat loss. The impact of development on the red data species would therefore be less than predicted.
- The protection of different habitat types in the area will be important to ensure the survival of the different animals due to each species' individual needs and requirements. Sufficient natural corridor sections should be protected around the proposed development footprints to allow fauna to move freely between the different vegetation units on the property. The drainage channels and sections of natural vegetation will be preserved as corridors in the area and mitigation measures should be implemented to ensure that the habitats are protected.
- The taller (>3m) indigenous trees within this area also provide resting/perching sites for larger birds like birds of prey, arboreal reptiles and mammals that might occur/pass through the area and should preferably be preserved. These larger trees should be protected as far as possible and be incorporated into the proposed development. The removal of large dead trees is also not advised as these trees also provide smaller habitats for the mentioned bat species as well as rodents. The grass layer on the other hand also provides a valuable food source (insects, reptiles, small mammals that occur in/on the grass layer) for fauna.
- A monitoring programme needs to be implemented by a specialist if any rare species are confirmed on the property.

9.4.8.9 Summary and results of the Terrestrial Biodiversity Impact Assessment

Detailed ecological (fauna habitat & flora) surveys were conducted during November 2022 to verify the ecological sensitivity and ecological components of the site at ground level. The timing of the season was considered as adequate due to sufficient rains received in the area during the winter months and early spring. The survey was considered successful.

Most sensitive sections: It is evident from the distribution of biodiversity, presence of threatened species and sites of scientific interest, that the proposed development has the potential for negative impact on the flora and faunal of the study area. This is particularly true of the sensitive vegetation associated with the riverine and wetland ecosystems and the larger project area.

Most sensitive habitats: Many threatened species are grassland specialists, linked to these habitats either for breeding, feeding or shelter. Major impacts on drainage areas to the east of

the site should be avoided wherever possible during construction. Where unavoidable impacts will occur on grassland and drainage channels, strict mitigation measures and legislation should be implemented (IWUL application etc.).

Monitoring of threatened species: Many endemic and protected species have been recorded in region. The EMPr for the development should highlight the conservation status of these species and note that steps must be undertaken in conjunction with conservation authorities to protect or translocate any populations encountered during project actions. Ecological monitoring is recommended for the construction phase of the development considering the presence of potential red data fauna on areas surrounding the site.

The importance of rehabilitation and implementation of mitigation processes to prevent negative impacts on the environment during and after the construction phase of the solar development should be considered a high priority. The proposed site for the development varies from being in a slightly degraded to pristine state.

A sensitivity analyses was conducted to identify the most suitable site for the development. From this investigation and ecological surveys, the following main observations were made:

- Most of the natural grassland and woodland have a Medium Sensitivity and development can be supported in the area provided certain mitigation measures are implemented. Where the clearance of the vegetation would cause protected plants or other fauna to be removed, permits should be obtained from the relevant authorities.
- The secondary grassland has a Medium-low Sensitivity due to the state of succession and degradation in the area.
- The degraded grasslands, croplands and exotic bush clumps have a low sensitivity and unlimited development can be supported in these areas.
- The riparian zones have a high sensitivity and should be preserved as important fauna and flora habitats.

The protected plant species *Boophane disticha* and *Helichrysum nudifolium* occur on the site and specific mitigation measures (permit applications, avoidance, relocation) should be implemented to avoid negative impacts on the species.

Some potential rare fauna may also occur in the area, and specific mitigation measures need to be implemented to ensure that the impact of the development on the species' habitat will be low. Specific mitigation relating to red data fauna includes the following:

- Disturbances in close vicinity of the development (periphery) should be limited to the smallest possible area to protect species habitat.
- Corridors are important to allow fauna to move freely between the areas of disturbance.

Several ecological potential impacts were identified and assessed. A few of these were assessed as having potentially medium or high significance, including the following:

- Destruction or disturbance to sensitive ecosystems leading to reduction in the overall extent of a particular habitat.
- Increased soil erosion.

- Impairment of the movement and/or migration of animal species resulting in genetic and/or ecological impacts.
- Destruction/permanent loss of individuals of rare, endangered, endemic and/or protected species.
- Establishment and spread of declared weeds and alien invader plants.
- Soil and water pollution through spillages.
- Establishment and spread of declared weeds and alien invader plants.
- Impacts of human activities on fauna and flora of the area during construction.
- Air pollution through dusts and fumes from construction vehicles.

Mitigation measures are provided that would reduce these impacts from a higher to a lower significance. A monitoring plan is recommended for the construction phase of the development should the proposed application be approved.

The proposed development should avoid sensitive areas such as wetlands and riverine areas, while also allowing corridors of indigenous grassland on areas outside the development footprint to be preserved. Where sensitive areas of natural vegetation cannot be avoided, a few mitigation measures have been recommended to minimise and/or offset impacts (licence application for eradication of protected species.). Negative impacts can be minimised by strict enforcement and compliance with an Environmental Management Plan which considers the recommendations for managing impacts detailed above.

According to the Ecological Specialist, provided that the proposed development and layout plans is consistent with the sensitivity map and take all the mitigation measures into consideration stipulated in this report, the planned development can be supported.

9.4.8.10 Cumulative impacts

It is unclear whether other projects not related to renewable energy is or has been constructed in this area, although several other projects are proposed. In general, development activity in the area is focused on agriculture and mining. Solar farms will be developed within the general area.

Regionally landscape fragmentation could create barriers to the movement of species and their genes (Saunders et al., 1991). Corridors for mammalian species are especially important for migratory species (Mwalyosi, 1991; Pullin 2002). Published information about cumulative effects, metapopulations and fragmentation of landscapes is in general scarce, especially for local and regional areas.

Corridors and linkages of areas with similar habitat are present in the area where several solar power plants are planned. Watercourses and wetlands will be avoided by the proposed footprints so that steppingstone corridors (pans) and a network of linked corridors (active channels with riparian zones) remain.

Because most of the Virginia area appears to be ideal to avoid very sensitive habitats such as larger pristine wetlands and highly sensitive habitat pockets of threatened species, the development of a several solar plants appear to be more ideal on a national scale than at many

other areas. Therefore, an important mitigation measure is to leave corridors with indigenous vegetation in between solar plants and their associated infrastructure.

Overall, because of the restricted nature of solar plants and few or no emissions and pollutants into air when operational, soil and water cumulative impacts to the environment are limited (if compared for example to emissions from fossil fuel burning). Ultimately power plants could relieve the pressures to use fossil fuels that are associated with numerous cumulative impacts and habitat losses.

9.4.9 VISUAL

A Visual Impact Assessment (Annexure J) was conducted by Mitha Cilliers Landscape Architect to determine the visual impact of the proposed solar park and power lines.

Visually Sensitive Receptors within the study area with a high sensitivity comprised of residential type receptors including: farmsteads with associated residences, the town of Virginia and the township of Meloding, agricultural holdings, clusters of residences and other small communities; tourist attractions including game farms, of which the Willem Pretorius game reserve is the largest, guest houses and events locations as well as historical landmarks including the Sandrivier Convention Memorial Stone as well as the N1 National road due to its prominence as a national road linking the Southernmost tip of Africa to the rest of the continent.

The generalized **Relevance** of the visual impact on these receptors were as follows:

- **Residential: *marginal***
- **Transport: *marginal***
- **Business / Occupational / Industrial: *marginal***
- **Open Space Users / Recreational: *marginal***

VSRs with the largest anticipated impact include the residences on the farm Welgelegen No. 382, located just over 400m and approximately 3,2km to the southwest of the proposed new layout of the Florida power line. For the nearest farmstead the visual impact relevance of the impact would be substantial. Views would however include the existing power line, located just over 550m from the viewer, which would form part of the backdrop of the view. Existing buildings and vegetation would partially screen the proposed project components from the viewer. The anticipated impact has been mitigated by using one instead of the originally proposed four power lines. The newly proposed Florida 400kV substation is located approximately 2,0km, 2,7km, and 4,0km from the farmsteads on the farm Welgelegen, the substation would be in the background of views from these key viewpoints and include views of various existing power lines.

Mitigation measures are listed in Table 4 of the Visual Impact Assessment and the EMPr.

From the visual impact analysis, it is clear that the implementation of the proposed Florida Solar Park & Powerline, would have a **medium significance** for all visual receptors, during all phases of the project, with or without the correct and effective implementation of the proposed

mitigation measures except when mitigation measures are implemented correctly and effectively in the decommissioning phase, then the rating would drop to **low-medium**.

Cumulative impacts

The developer proposes four solar park developments in this area. It should be noted that the study area already contains a transmission substation and a network of power lines consisting of a range of pylon sizes. These are however, mostly located north of the proposed solar park developments. The power lines for the proposed developments will all follow along the same route and only divert off to tie into their respective solar park developments. This strategy aims to reduce the anticipated impacts from the power lines. Each of the proposed power lines would contribute cumulatively to the effect of the existing power lines within the context of the receiving environment. The proposed pylons are however smaller than the pylons of the existing power lines.

The proposed power line for this project would run alongside the other proposed power line for approximately 3,2km where they would enter the newly proposed Florida 400kV substation. For the new substation a single power line would run parallel the existing power line for approximately 4,4km before it reaches the Theseus MTS. The ZVI for the Florida Solar Park power line covers approximately 60% of the ZPVI whereas the combined ZVI for all four power lines would cover approximately 65% of the ZPVI. Individually and cumulatively the impact from the power line can both be rated as intermediate (70 - 41%). The cumulative impact of the four power lines would be marginally larger, 5%, than the ZVI for the proposed Florida power line in isolation.

There are no other solar parks within the current context / study area. However, the study area has a mixed mining / industrial / pastoral sense of place. As stated above, this project is one of four solar park development projects proposed by the developer as a second phase of a previous round of proposed solar park developments within the same study area. The solar parks are all clustered together, this strategy reduces the overall / cumulative visual impact albeit adding to the mining / industrial sense of place.

The ZVI from the proposed solar park would cover approximately 18% of the ZPVI. Cumulatively, the ZVI's of the four proposed solar park projects would cover 29% of the ZPVI for the study area. Both individually and cumulatively, this can be rated as small impact (40 – 11%). The ZVI for this solar park is just over a tenth of the cumulative ZVI for the solar parks combined.

The combined ZVI for the power line and solar park would be approximately 54% of the ZPVI. The cumulative impact of all four projects is anticipated to be 58% of the ZPVI. The cumulative impact would be marginally larger, 4%, than the individual ZVI.

9.4.10 SOCIO-ECONOMIC ENVIRONMENT

A report on socio-economic considerations related to the proposed project was compiled and is attached in Annexure N. Based on desk-top considerations and with information available, the socio-economic impact of the proposed Florida Solar Park Project is assessed as follows:

9.4.10.1 Construction Phase

- **Promotion of the Solar Energy Value Chain**

Almost the entire impact of the proposed project on the local solar energy industry value chain will occur before and during the construction phase, because this is when the components will be required. This impact is positive, with a low to moderate significance.

- **Job Creation and Skills Development**

Approximately 200 construction and panel installation jobs are expected to be created for a period that is unlikely to exceed 24 months. Skills development, especially for panel installation, will contribute meaningfully to the viability of other potential solar project developments in the Free State. This impact will be positive, but with relatively low significance due to its short duration.

- **Crime and Social Disruption**

Construction projects are associated with increased levels of crime and disruption to established local social relationships. This impact could be negative, albeit low. The significance can be further reduced by way of mitigation measures that should include an appropriate security and workplace safety protocols that the main contractor and all subcontractors should adhere to.

9.4.10.2 Operational Phase

- **Contribution to the Constrained National Electricity Grid**

The project will contribute up to 240 MW to a constrained national grid, thereby reducing the need for load shedding with its negative consequences for economic production, growth and job creation and maintenance of equipment. The impact is positive with a high significance.

- **Capital Formation and Investment Attraction**

Capital investment of approximately R3.4bn will be required (170 MW at R20m/MW) of which a substantial proportion is likely to be foreign capital as indicated by the REIPPPP projects that have been procured to date. The impact is positive with a high significance. This excludes the new transmission line.

- **Reduction in CO₂ Emissions per Unit of Electricity Generated**

CO₂ emissions for 170 MW of solar energy will be reduced relative to coal fired power generation, which is the current national standard. The quantity of CO₂ potentially avoided by this project will be approximately 641 164 tons per year based on the average Eskom emission

factor of 1.015 tons/MWh and assuming that the PV modules will be mounted on trackers. This impact is positive with high significance.

- **Lower Tariffs per Unit will Reduce Inflationary Pressure**

Lower and declining electricity tariffs from solar energy compared to fossil fuel generated electricity (solar and wind energy tariffs are approximately R0.50/kWh, compared to the coal tariff of R1.03/kWh). This effective halving of an important utility tariff will have a mitigating effect on administered prices and therefore on inflation. The economic impact of the proposed project will therefore be positive with a moderate significance.

- **Promotion of the Solar Energy Value Chain**

Every new solar project that is developed in South Africa makes the establishment of an industry to support local manufacturing of components more viable. The footprint for such industry development has already been created in various industrial parks in SA. Economic impact of the proposed project will t be positive with a low to moderate significance. Positive impact will increase with a concentration or clustering of new projects in an area, which is the intention in Matjhabeng Local Municipality. Clustering will potentially increase even further with the proposed development of six solar projects in Dealesville approved under bid window 5.

- **Job Creation and Skills Development**

Permanent job creation on the proposed project could be 55 people. More jobs will emerge within the value chain for manufacturing of components. Albeit important, these numbers are relatively small in the context of current employment in Matjhabeng Municipality, which is in the order of 125,000. An important new range of renewable energy industry skills will be acquired, which are essential for the local competitiveness of this industry. This socio-economic impact is positive, but with a low significance.

- **Community Development**

In terms of REIPPPP prescriptions, developers are expected to contribute 1.5% of turnover to community development in the vicinity of the project. This commitment has not yet been formalised but should be structured in a way that will contribute meaningfully to a quality of life of a local community who could be identified, in Ventersburg and Virginia, and engaged in consultation with the local municipality. Impact is positive with a low significance in terms of methodology for impact calculation, although the impact on the community itself could be significant.

- **Risk of Vandalism**

Vandalism of property is a risk associated with high levels of poverty. This impact is potentially negative, considering the high value of solar PV panels. Mitigation measures will be required in the form of equipment design, installation, and on-site security.

9.4.10.3 Conclusion on Socio-Economic Assessment

The socio-economic impact of the proposed Florida Solar Project is considered positive, and the application is supported, provided that all the mitigation measures proposed by specialist consultants are implemented. The project is consistent with development policies at the national, provincial and local government levels, although the institutional readiness for a project of this nature will have to be carefully managed at the municipal level.

9.4.11 AGRICULTURAL POTENTIAL

An Agricultural Potential Impact Assessment on soils potential was conducted and is included in this Report in Annexure G. A thorough investigation of the soil types of the proposed development site is necessary for an accurate classification of the soils. The main aim of the study is to identify the soil types on site and evaluate their specific characteristics to determine the agricultural potential of the soils.

The assessment of agricultural potential and land capability of the study area will be based on a combination of desktop studies to amass general information and then through site visit for status quo assessment, soil sampling and characterization, and the validation of generated information from desktop studies:

- Definition of parameters of land as stipulated by Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970) and Amended Regulation of Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Classification of high potential agricultural land in South Africa compiled by Agricultural Research Council (Schoeman, 2004) for the National Department of Agriculture.
- Long-term climatic data record of the study area, obtained from Weather SA.
- Geophysical features of the site using Geographical Information System.
- Moisture availability class, determined through seasonal rainfall and fraction of the potential evapotranspiration (ARC, 2002).
- Field visit to the project site for general observation, survey of the farm in terms of vegetation, soils, water resources, terrain type and infrastructural profile.
- Previous and current land use of the farm and that of the neighbourhood.
- Other agro-ecological factors prevailing in the area.
- Agricultural potential of the property.
- Possible crop productivity or value of the farm for grazing purposes.

The proposed development area shows some variations in terms of soil characteristics and soil types identified during the survey. The classification of soils on the farm was based on land type description and the Binomial System for South Africa, which classifies soils into forms and families based on the diagnostic horizon of the soil profile. Exposed soil profile characteristics created by road cuttings in the field were also used in describing the local soil form. Soil identification and classification of the dominant soil type were done.

9.4.11.1 Soil classes

The soils were classified into broad classes according to the dominant soil form and family as follows:

- Red-yellow apedal soils of the Hutton soil forms.
- Red-yellow apedal soils of the Avalon / Clovelly soil form.
- Yellowish sandyclay soils of the Oakleaf soil form.
- Grey-brown clayey soils of the Valsrivier / Katspruit / Rensburg soil forms.

The vegetation patterns showed a strong correlation to the major soil units mapped in the study area.

- **Red-yellow apedal soils of the Hutton soil form**

Description: Hutton soils are identified based on the presence of an apedal (structureless) “red” B-horizon as indicated in the figure below. These soils are the main agricultural soil found in South Africa, due to the deep, well-drained nature of these soils. The Hutton soils found on the site are restricted to the solar plant footprint area. The Hutton soil form on site is deep, although it has a low clay content. The relatively high magnesium and iron content of the parent rocks from which these soils are derived, impart the strong red colours noted.

Landscape: Slightly undulating plains

Depth: 600-1200mm

Texture: Fine sandy to sandy loam

Average Clay Content: 6-15%

Agricultural Potential: Moderate potential soils— soils deep and often very sandy that causes a low water holding capacity, although the clay content of the soils is insufficient. Under the climatic conditions these soils would not sustain arable crop production. The most viable option for crop production on the soil form is under irrigation considering the variable rainfall and moisture availability due to higher day temperatures. Irrigation is not a common practice in the study area though and for any irrigation to be undertaken in the area, it will require the installation of a few surface water impoundments as storage during the dry months. The limited water availability, high evaporation rates and high water demands by crops would therefore render crop cultivation not sustainable in the study area. The many old, cultivated fields confirm that crop cultivation over the longer term is not a financially viable option under the prevailing climatic conditions.

Land capability: Livestock and / or game grazing are viable due to the slightly higher nutrient and organic content of the topsoil in woodland areas that support a mixture of palatable and unpalatable species.

- **Red-yellow apedal soils of the Avalon / Clovelly soil forms**

Description: Avalon soil form is characterised by the occurrence of yellow-brown apedal B-horizon over a soft plinthic B – horizon. Yellow-brown apedal horizon is the same as the Clovelly soil form and the plinthic horizon has the following characteristics:

- Has undergone localised accumulation of iron and manganese oxides under conditions of a fluctuating water table with clear red-brown, yellow-brown or black strains in more than 10% of the horizon.
- Does not qualify as a diagnostic soft carbonate horizon.
- These soils are found lower down the slopes than the Hutton soils and indicate the start of the soils with clay accumulation.

Clovelly soils can be identified as an apedal “yellow” B-horizon. These soils along with Hutton soils are the main agricultural soil found within South Africa, due to the deep, well drained nature of these soils. The Clovelly soils occur as a mosaic with the Avalon soil forms in the central section of the power line site. The Clovelly soil form on site is deep, although it has very low clay content. Generally, these soils were noted to interface directly on a hard rock or calcrete contact with only a thin saprolitic layer. Compaction and erosion are physical hazards to be aware of, and catered for, when working with these soil types.

Landscape: Plains

Depth: 800-1 200mm

Texture: Sandy-loam-clay

Average Clay Content: 6-20%

Agricultural Potential: Moderate to low potential soils, due proximity to wetlands and erodibility of soils.

Land capability: The grazing potential of these low-lying areas is high due to the palatable grasses growing throughout the year on these soils. Soils are very sensitive and prone to erosion. A specific strategy is needed to prevent damage to these soils considering that overgrazing and trampling has already caused some degradation of these areas.

➤ **Yellowish sandy-clay soils of the Oakleaf soil form**

Description: Oakleaf soil consists of an orthic A horizon, overlying a neocutanic brown apedal B horizon. Oakleaf soils are good agricultural soils due to their sandy clay loam textures. These soils are cultivated easily, hold water and adsorb nutrients allowing optimal crop production.

Landscape: Slightly undulating plains

Depth: 600-1 200mm

Texture: Fine sandyloam soils

Average Clay Content: 8-15%

Agricultural Potential: Moderate potential soils– soils deep and often sandy-clay-loam structure that causes medium water holding capacity, although the clay content of the soils is sufficient. Under the climatic conditions these soils would not sustain arable crop production. The most viable option for crop production on the soil form is under irrigation considering the variable rainfall and moisture availability due to higher day temperatures. Irrigation is not a common practice in the study area though and for any irrigation to be undertaken in the area,

it will require the installation of several surface water impoundments as storage during the dry months. The limited water availability, high evaporation rates and high water demands by crops would therefore render crop cultivation not sustainable in the study area.

The many old, cultivated fields in the larger area confirm that crop cultivation over the longer term is not a financially viable option under the prevailing climatic conditions.

Land capability: Livestock and / or game grazing are viable due to the slightly higher nutrient and organic content of the topsoil in woodland areas that support a mixture of palatable and unpalatable species.

- **Black or dark grey clayey soils associated with the drainage channels and floodplains of the Valsrivier / Katspruit / Rensburg soil forms.**

Binominal Classification S.A.: Rensburg / Katspruit / Valsrivier soil forms

Description: The Rensburg Soil Form is also characterised by the occurrence of a vertic A horizon, with the A-horison underlain by a G-horizon (Photograph 5)

Landscape: Drainage channels and wetlands (Photographs 6)

Depth: 700-1000mm

Texture: Clay

Average Clay Content: 40-60%

Agricultural Potential: Zero potential soils, due to the soil wetness these areas are not suitable for crop cultivation under arable conditions.

Land capability: The grazing potential of these low-lying areas is high due to the palatable grasses growing throughout the year on these soils. The only limiting factor may be that livestock movement is limited during the wet season when the clay expands, causing livestock to get stuck in the muddy conditions. Soils are very sensitive and prone to erosion. A specific strategy is needed to prevent damage to these soils considering that overgrazing and trampling has already caused some degradation of the floodplains.

9.4.11.2 Agro-Enterprise and Land Capability

- **Site micro-siting and allowable development limits**

The proposed solar development is completely in line with the allowable development limits set in the Table below. No deviation occurred from the set development limits.

The extent of the impact of the proposed development on the agricultural resources is considered Medium to low considering that most of the croplands will be left undeveloped (only 0.25ha developed for each MW of the solar plants).

All reasonable measures have been considered in the micro-siting of the proposed development to minimise fragmentation and disturbance of agricultural activities.

Table 27. Allowable development limits for solar developments generating 20MW or more.

Criteria (land capability evaluation value and category of crop boundary)	Allowable development limits in hectares per MW of installed generation capacity (with sensitivity ratings from the national web based environmental screening tool shown in brackets)	
	Within field crop boundaries	Outside field crop boundaries
Land capability evaluation value of 11 – 15; Irrigation, horticulture/viticulture, shade-net; high value agricultural areas with a priority rating A and/or B	0 (Very High Sensitivity)	0 (Very High Sensitivity)
Land capability evaluation value of 8 – 10; all cultivated areas including sugarcane; high value agricultural areas with a priority rating C and/or D	0.20 (High Sensitivity)	0.35 (Medium Sensitivity)
Land capability evaluation value of 6 - 7;	0.25 (High Sensitivity)	2.50 (Low Sensitivity)
Land capability evaluation value of 1 - 5;	0.30 (High Sensitivity)	2.50 (Low Sensitivity)

➤ **Arable land (crop production)**

Based on Part 1 of the Regulation of Conservation of Agricultural Resources Act 43 of 1983, the proposed area, earmarked for the development of the Florida Solar Park and associated power line, located in the Free State Province can be classified as having **Moderate** potential soils because of the following:

- The proposed development site is composed of clayey to sandy to sandy-loam soils. From the soil textural analysis, it can be concluded that the soil has a clay content varying between 4 (sandy soils) and 30% (clayey soils). The soils are further predominantly red-yellow apedal soils with a loamy texture on the plateaus in the north-western and north-eastern section of the site, while the southern section of the development footprint is dominated by black clayey soils.
- The farm is expected to receive an annual rainfall of about 560 mm which is relatively low and highly variable. The farm is in an area which is marginal to dry for rain-fed arable crop production. Economically viable farming is thus, restrictive to irrigated cropping due the high risk that could be associated with dry-land farming. At present no irrigation or centre pivots occur on the property. Furthermore, higher day temperatures and evaporation rates in summer months may hamper soil moisture storage for crop use.

➤ **Grazing land (Livestock production)**

The current vegetation at the proposed site of development consists mainly of areas of with mixed quality grazing (highly palatable and unpalatable grasses) throughout most parts of the site and these areas can support limited grazing by livestock and game species. The nature of the vegetation and size of the properties make the area marginal for extensive livestock production. Using planted pasture to supplement livestock production is an option considering the water availability for extensive irrigation.

Considering that re-growth of grass will take place under the panels as the mounting systems are at least 1m above ground level, the grazing value of the land will still be available to small livestock such as game and sheep. At the end of the lifetime of the solar plant, structures will be removed, and natural vegetation will re-establish naturally. The grazing value of the land can therefore be increased by using planted pasture underneath the solar panel mounts. The nature of the vegetation at the farm is therefore marginal for extensive livestock production. Using planted pasture to supplement livestock production is however possible but this could be constrained by high demand for irrigation water due to the shallow and often sandy nature of the soil and relatively higher day temperatures in summer.

The nature of the vegetation at the farm is therefore **marginal** for extensive livestock production. The site is classified as partially arable to non-arable.

➤ **Impacts on the agricultural capability**

The impacts associated with the proposed development on the agro-ecosystem capability will depend on the specific area where the development will take place. The following list of impacts is anticipated with the proposed developments on the soils and land capability in the area during the construction phase:

- Disturbance of soils (soil compaction, erosion and crusting);
- Soil contamination due to leaching of soluble chemical pollutants;
- Loss of current and potential agricultural land.

Provided that the proposed development and layout plans is consistent with the agro-ecosystem sensitivity map and take all the mitigation measures into consideration stipulated in the Agro-ecosystem report, the planned development can be supported.

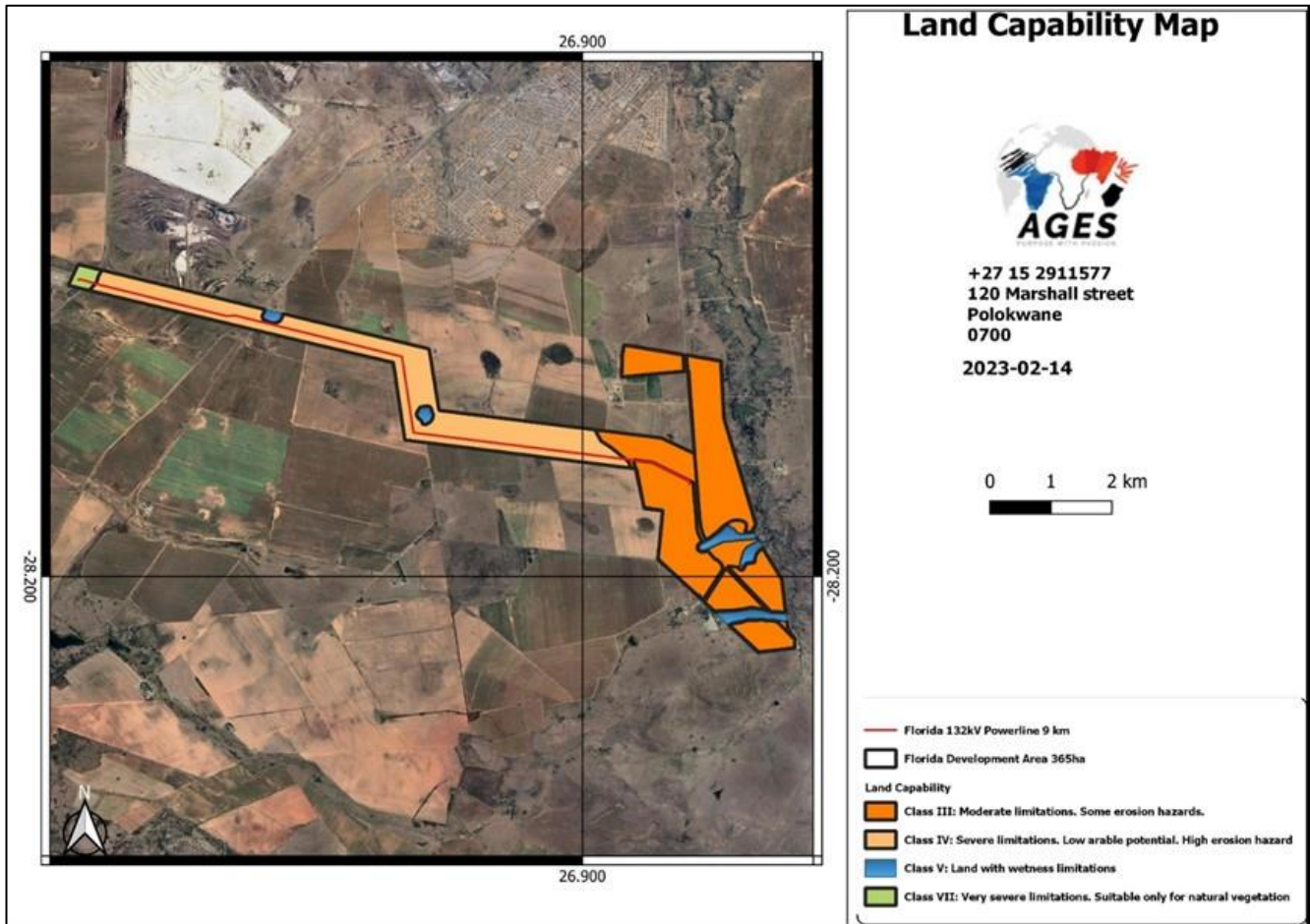


Figure 16. Land capability Map of the project area

➤ **Impacts on the agricultural capability**

The impacts associated with the proposed development on the agro-ecosystem capability will depend on the specific area where the development will take place. The following list of impacts is anticipated with the proposed developments on the soils and land capability in the area during the construction phase:

- Disturbance of soils (soil compaction, erosion, and crusting).
- Soil contamination due to leaching of soluble chemical pollutants.
- Loss of current and potential agricultural land.

➤ **Alternative development footprint assessment on low or medium sensitivity areas**

The areas with a low or medium sensitivity from an agricultural point of view was not considered suitable due to having rocky soils or being near seasonally wet soils.

9.4.12 CULTURAL AND HERITAGE RESOURCES

An Archaeological Impact Assessment (Annexure G) was conducted by CES Environmental and Social Advisory Services (Mr N Kruger) to ascertain whether there are any remains of significance in the area that will be affected by the proposed development.

A few heritage resources were identified during the site survey and the following observations were made:

- No human burials were located during the site assessment and impact on burial sites is not anticipated during the preconstruction, construction, and operation phases of the project. However, it should be noted that graves and cemeteries do not only occur around farmsteads in family burial grounds, but they are also randomly scattered around archaeological and historical settlements in the rural areas of the Free State Province. The probability of previously undetected informal human burials encountered during the construction phase should thus not be excluded. Site monitoring by an informed ECO will be required throughout the construction phase of the project to avoid the destruction of previously undetected human burials.
- Two settlement areas dating to the Historical Period were noted in the proposed Florida Solar Park area (Site FSP-HP01, Site FSP-HP02). The sites are poorly preserved and of low heritage significance. Still, clearing and construction activities such as excavations may expose previously undetected artefacts, structures or human remains and site monitoring by an informed ECO will be required throughout the construction phase of the project.
- Two contemporary period features (FSP-CP01, FSP-CP02,) occur within the proposed Florida Solar Park Project and powerline corridor but have NO heritage significance.
- A stone-built ruin (FSP-HP03) was noted approximately 80m east of the project area on the farm Kriegers Kraal. The feature was probably an old multi-room house, and it might have been part of the Kriegers Kraal farmstead infrastructure. The site is generally protected under the National Heritage Resource Act (NHRA 1999) and it is of medium heritage significance. It is unlikely that the site will be impacted by the development.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended, and the archaeological specialist should be notified immediately.

It is the opinion of the Specialist that the proposed Florida Solar Park and its associated power line connection will have a little to negligible negative cumulative impact on the heritage value of the area for the following reasons:

- The absence of significant archaeological resources documented in the project area and in its immediate surroundings implies low-severity short and long-term impacts on the heritage landscape.
- The transformed nature of much of the project landscapes and the presence of agricultural fields, large-scale mining and existing power lines in development areas means that the significance of the landscape in terms of its heritage is bound not to change during construction, operation and decommissioning of the project.
- The heritage context and sensitivity of the proposed development zones points to a landscape of limited heritage significance on a local level.
- It should be noted that archaeological knowledge and the initiation of research projects

into significant archaeological sites often result from Heritage Impact Assessments conducted for developments. Provided that significant archaeological sites are conserved, and that appropriate heritage mitigation and management procedures are followed, the cumulative impact of development can be positive.

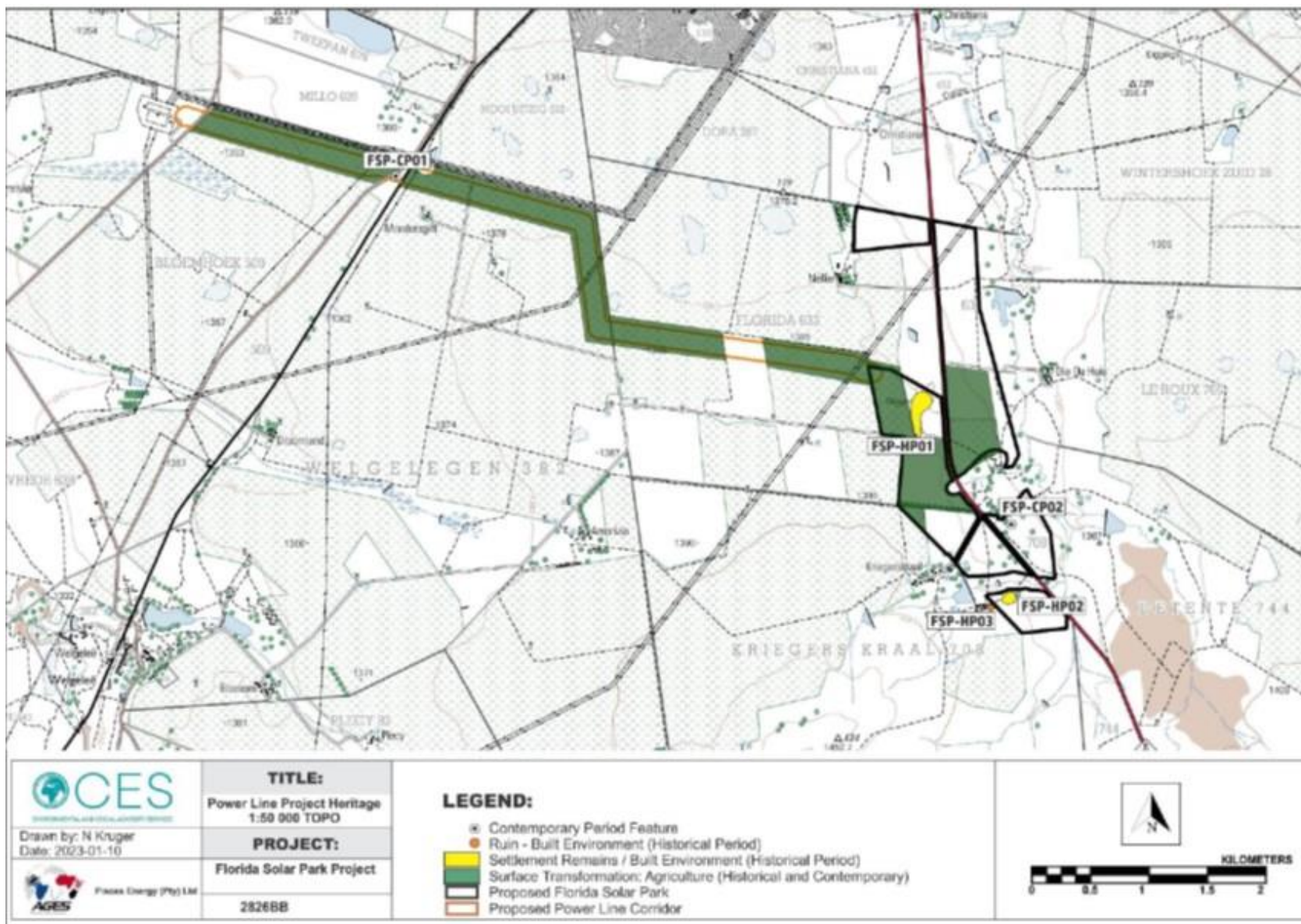


Figure 17. Heritage archaeological sites located within the PV Park & connecting powerline corridor

9.4.13 PALAEOLOGICAL RESOURCES

Palaeontological Impact Assessments (Annexure I) were conducted by Prof Marion Bamford for the PV area and connecting powerline. The study area is situated in the Main Karoo Basin of the Free State province. The farm is underlain by Late Permian rocky deposits of the Adelaide Subgroup of the Lower Beaufort Group of the Karoo Supergroup. These Karoo rocks are overlain by Quaternary alluvial deposits (soil) which are covered by vegetation.

According to the Palaeontological Impact report there were no rocky outcrops, and NO FOSSILS present on the land surface on the **Solar PV site**.

Recommendations of the Palaeontological Specialist

Based on the fossil record for the area but confirmed by the site visit and walk through there are no rocky outcrops and NO FOSSILS of the Daptocephalus Assemblage Zone (Adelaide Subgroup, Beaufort Group, Karoo Supergroup) of flora or fauna 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 below the ground surface in the shales of the Adelaide Subgroup so a Fossil Chance Find Protocol should be added to the EMPr.

If fossils are found by the contractor, environmental officer, or other responsible person, once excavations and drilling have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample.

Since the impact will be low to moderate, as far as the palaeontology is concerned, the project should be authorised.

Cumulative Impact

None. Since each fossil outcrop is unique and may or may not be extensive. The destruction or preservation of one site will not impact on other sites. The same applies to developments on the sites. They are independent of each other. In addition, there are no fossils on this this project footprint so there is no impact on the national paleontological heritage.

9.4.14 TRAFFIC IMPACT ASSESSMENT

9.4.14.1 Findings of the traffic assessment

- Access to the proposed development will be from the R73 Road that is in a good condition.
- The relevant section of Road R73 where the Proposed Solar Park is intended to be located is in a rural setting with limited farming activity in the area, and as determined from the 12-hour manual traffic counts has a low volume of vehicle traffic along the relevant section of Road R73.

- The road network-related impact from a road capacity perspective due to the Proposed Florida Solar Park would have a low significance due to a low volume of vehicles along Road R73 as determined by the relevant 12-hour manual traffic counts and that no road capacity-related mitigating measures would be required.
- The road network-related impact from a road safety perspective in terms of intersection spacing would have a medium significance if not mitigated due to the presence of existing farm access intersections within the vicinity of the Proposed Florida Solar Park.
- To adhere to the required intersection spacing (1.6km for a rural class 3 road), the existing Eastern Farm Access Road which intersects with Road R73 at Point 2 (Point A-2) would need to be relocated to Point A and the existing Southern Farm Access Road which intersects with Road R73 at Point 4 would need to be relocated to Point C. With the implementation (mitigation) of the required intersection spacing, a low significance in terms of intersection spacing would be relevant.
- The road network-related impact from a road safety perspective in terms of intersection sight distances due to the Proposed Florida Solar Park access intersections (Points A, B, and C) would have a low significance due to the required intersection sight distances being sufficient at the proposed access intersections and no mitigating measures would be required.
- The road network-related impact from a road safety perspective in terms of the speed limit along Road R73 would have a low significance on the Proposed Florida Solar Park and no road safety-related mitigating measures in terms of the speed limit would be required.
- The road network-related impact from a road safety perspective in terms of the need for dedicated right-turn and left-turn lanes along Road R73 as part of the Proposed Florida Solar Park access intersection (Point B) would have a medium-high significance due to a potential increase in collisions (rear-end which could lead to fatalities), specifically, vehicles waiting within the main traffic flow lane of Road R73 to turn right into the Proposed Florida Solar Park if a dedicated right-turn lane on the northern approach of Road R73 at Point B is not provided. With the provision of the above-mentioned at the proposed access intersection (Point B), the impact from a road safety perspective in terms of the need for dedicated turning lanes would have a low significance.
- The road network-related impact from a road safety perspective in terms of pedestrian movements with the proposed access intersections (Points A, B, and C) due to the Proposed Florida Solar Park would have a low significance as no pedestrian activity is expected along Road R73 due to the rural locality of the Proposed Florida Solar Park and limited public transport availability, and that no road safety-related mitigating measures in terms of pedestrian movement would be required.
- The road network-related impact from a road safety perspective in terms of loading and off-loading of workers, specifically during the construction phase, as part of the Proposed Florida Solar Park would have a medium-high significance if a dedicated loading and off-loading area is not provided on site as part of the

Proposed Florida Solar Park and workers are loaded and off-loaded within the road reserve of Road R73. With the provision of a dedicated loading and off-loading area on site as part of the Proposed Florida Solar Park and ensuring that contractors make use of the dedicated area, the impact from a road safety perspective in terms of loading and off-loading workers would have a low significance.

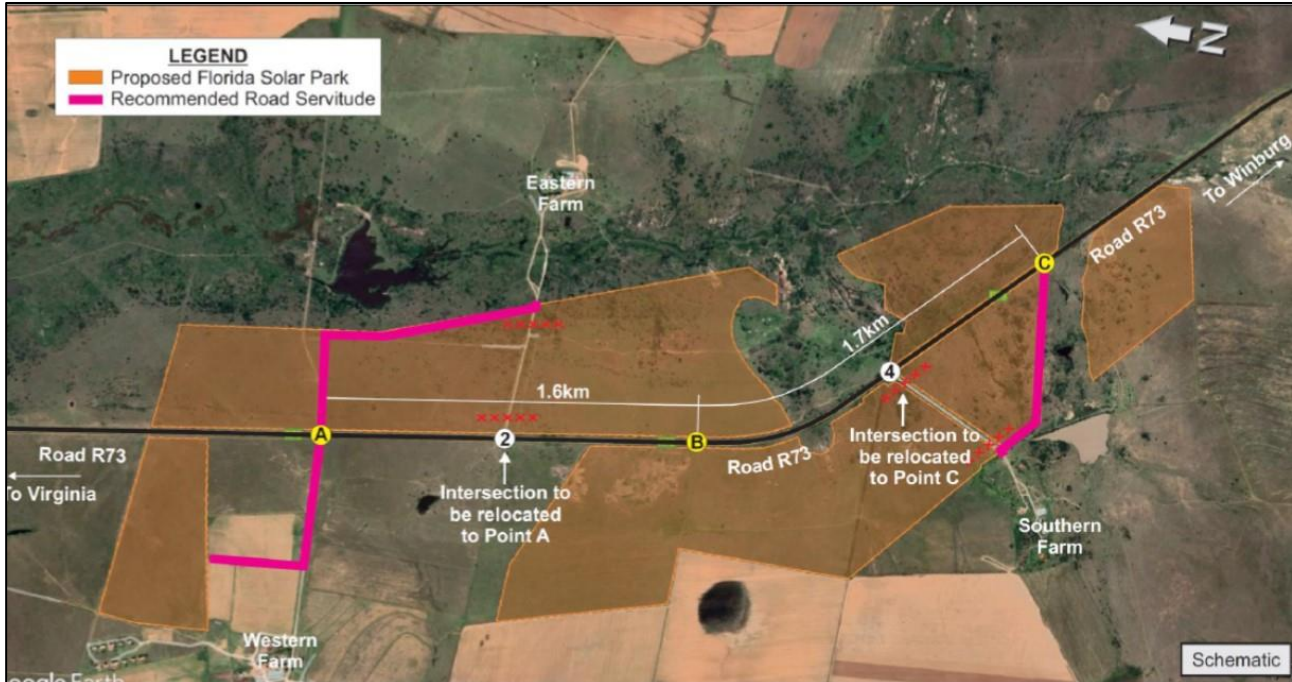


Figure 18. Proposed access points (A, B & C) for the Florida PV Park

9.4.14.2 Recommendations by traffic engineer

The following recommendations are made from a traffic engineering point of view:

- The following intersection improvements are recommended in Table 3.1 of the Traffic Impact Assessment with regards to intersection improvements:
 - Point A
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.
 - Relocate existing Western Farm Access Road (Point A-2) to Point A.
 - It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point A will only be used occasionally by maintenance staff.
 - Point B
 - Provide 60 meters dedicated right-turn lane on the northern approach of Road R73.
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.
 - It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point B will function as the main access to the Proposed Florida Solar Park.

- Point C
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.
 - Relocate existing Southern Farm Access Road (Point 4) to Point C.
 - It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point C will only be used occasionally by maintenance staff.
- As part of the construction phase of the proposed Florida Solar Park, a dedicated loading and off-loading area on site should be established where workers can safely be loaded and off-loaded by public transport or arranged transport.
- From a road safety perspective, on-site dust suppression of the proposed access roads (if gravel road) should be conducted when required to avoid road visibility issues caused by dust from vehicles making use of the road, which could lead to vehicle accidents.
- Approval for the position and geometric layout for the proposed access intersections (Points A, B & C) from and to Road R73 should be obtained from the Free State Department of Police, Roads, and Transport as part of the detailed design phase.

9.4.14.3 Reasoned opinion for authorisation of the proposed development

In conclusion of the findings as part of the investigations, Siyazi Limpopo Consulting Services (Pty) Ltd is of the opinion that the Proposed Florida Solar Park would have a manageable impact on the relevant road network during all phases and regardless of whether only one Solar Park or all the proposed Solar Parks are constructed and operational at the same time, as long as the mitigation measures are implemented as recommended in Section 3.2 of the Traffic report. In this case, it is therefore recommended that authorisation be granted.

The Traffic Impact Assessment Report is included in Annexure K.

9.4.15 RADIO FREQUENCY INTERFERENCE (RFI) ASSESSMENT

The RFI Assessment (Annexure L) was conducted by Mr. PF Smuts, an ECSA registered Engineer with more than 30 years of experience in the field of Radar, microwave, and RF technology.

No registered radio and/or communication sensitive installations were identified, and all equipment used by this project, will be subjected to the standard ICASA transmission/reception regulations and approval.

After evaluation and consideration of all activities identified, it is classified as low sensitivity to RFI and there should be no unacceptable impact on existing and potential, future installations if all equipment to be used permanently or temporarily has acceptable EMI/RFI levels that have been subjected to the ICASA requirements.

No Cumulative RFI effects are expected at any of the adjacent sites and whether there are one or more PV solar sites the outcome will be the same.

9.4.16 CIVIL AVIATION IMPACT REPORT

The applicant intends to undertake an activity identified in the scope of the Protocol for the Specialist Assessment and minimum Report Content Requirements for Environmental Impacts on Civil and Military Aviation Installations. Although a “low” sensitivity has been identified, TAC (Pty) Ltd (Aviation Consultant) undertook a safeguarding assessment for proposed new transmission lines in the Free State in the vicinity of Welkom Airport (FAWM), Harmony Mine Airport (FAHA) and Beatrix Mine Airport (FABX). There are NO SACAA promulgated areas or military installations in the vicinity of the project or airports.

The specialist verified that the Florida Solar Park Project will NOT interfere and will NOT have an impact on either Harmony Mine or Beatrix Mine Airport’s Obstacle Limitation surfaces, or the Approach/Departure surfaces. This is because the Florida Project’s location is outside the Harmony Mine and Beatrix Mine Airport’s Approach and Departure surfaces (Appendix 4). From figure 17 it can be verified that the Florida Project will NOT interfere and will NOT have an impact on Harmony Mine Airport’s Obstacle Limitation surfaces. This is because Florida Project is located outside Harmony Mine and Beatrix Mine Airport’s Approach and Departure surfaces.

As FAHA and Beatrix Mine Airports is Visual Flight Rules airports, only the Approach/Departure Surfaces were assessed. The Virginia Solar Parks and Powerline project will not interfere or affect both FAHA and Beatrix Mine Airport Obstacle Approach/Departure Surfaces. The Approach/Departure Surfaces path of all the runways do not pass over the project plant or powerlines.

The Aviation assessment report is attached as Annexure P.

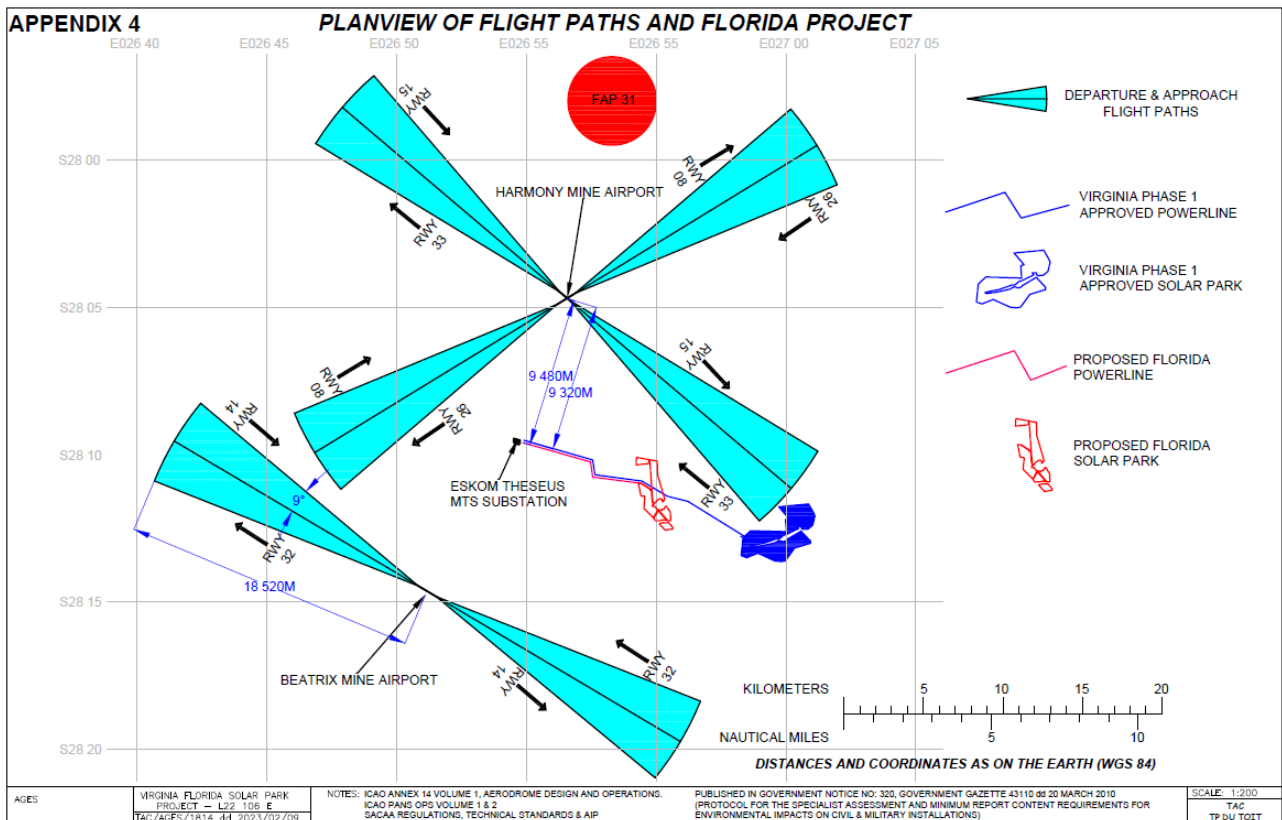


Figure 19. Flight paths for Florida project

9.5 IMPACTS AND RISKS IDENTIFIED

A clear statement will be made, identifying the environmental impacts of the construction, operation, maintenance, and management of the proposed project. As far as possible, the suite of potential environmental impacts identified in the study will be quantified and the significance of the impacts will be assessed. Each impact will be assessed and rated. The assessment of the data, where possible will be based on broadly accepted scientific principles and techniques. In defect, judgements and assessments will be necessarily based on the consultant's professional expertise and experience.

As previously described, construction activities for the establishment of the proposed PV power plant include:

- land clearing activities necessary for preparation of the site and access routes;
- excavation and filling activities;
- transportation of various materials;
- construction of the storage structures;
- installation of the PV modules and construction of associated structures and infrastructure; and
- construction of the on-site high-voltage substation.

EXTENT

The extent of most of the construction activities is localized and impacts will only occur at the development site. Some activities will extend to adjacent landowners as access roads will be used which will lead to an increase in the traffic in the area. These will be further investigated, and mitigations measures are included in the EIA report.

DURATION

The impact of construction activities will only be for the duration of the construction phase, after which it will cease completely. (Construction period planned to last between a minimum of 6 months and a maximum 15 months).

PROBABILITY

The probability of impacts occurring during the construction is phase very high as there will be impacts on the vegetation as most will be removed to make way for the proposed development.

Environmental impacts associated with the operational phase of a solar energy facility include visual and other impacts.

The decommissioning activities of the PV plant mainly include the removal of the project infrastructure and the restoring of the site *status quo ante*.

The identification of impacts will be based on:

- legal and administrative requirements;
- the nature of the proposed activity;
- the nature of the receiving environment;
- specialist studies and
- issues raised during the public participation process.

Environmental impacts associated with the operational phase of a solar energy facility may include visual and other impacts.

The decommissioning activities of the PV plant mainly include the removal of the project infrastructure and the restoring of the site *status quo ante*.

The identification of impacts will be based on:

- legal and administrative requirements;
- the nature of the proposed activity;
- the nature of the receiving environment;
- amended specialist studies; and
- issues raised during the public participation process.

Potential impacts include:

- Impacts on soils & agricultural potential.
- Impacts on ground water.
- Impacts on the road system and traffic.
- Impacts on air quality and potential emissions.
- Geological, soil and erosion impacts.
- Impacts on avifauna.
- Impacts on vegetation.
- Impacts on heritage resources.
- Noise impacts.
- Impacts on tourism.
- Social impacts.
- Visual impacts.

Potential impacts identified include:

- **Impacts on soils & agricultural potential**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: High
 - Significance: Low
- **Impacts on ground water**
 - Extent: Surrounding and adjacent land
 - Duration: Life of the project (approx. 30 years)
 - Probability: Medium
 - Significance: Low
- **Impacts on the road system and traffic**
 - Extent: Surrounding and adjacent land
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Low
- **Impacts on air quality and potential emissions**
 - Extent: Regional
 - Duration: Life of the project (approx. 30 years)

- Probability: Very Low
- Significance: Very Low
- **Geological, soil and erosion impacts**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Low
- **Impacts on avifauna**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Low
- **Impacts on vegetation**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: High
 - Significance: Medium
- **Impacts on heritage resources**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Low
- **Noise impacts**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Very Low
- **Impacts on tourism**
 - Extent: Regional
 - Duration: Life of the project (approx. 30 years)
 - Probability: Low
 - Significance: Low
- **Social impacts**
 - Extent: Regional & Locally
 - Duration: Life of the project (approx. 30 years)
 - Probability: High
 - Significance: High - Positive
- **Visual impacts.**
 - Extent: Locally at the proposed site
 - Duration: Life of the project (approx. 30 years)
 - Probability: Definite
 - Significance: Medium

The significances of the potential impacts were determined from the various specialist studies.

9.5.1 DEGREE TO WHICH THE IMPACTS CAN BE REVERSED

- The visual impact is resident for a long time (25-30 years). It can be reversed during decommissioning and rehabilitation of the area.
- Biodiversity impacts can be reversed at the decommissioning stage of the development. Plants can be replanted, and animals will return to the project area.
- Impacts on soil (erosion) can be reversed by careful handling of storm water on site.
- Impacts on water quality and quantity can be reversed at the decommissioning stage.
- Agricultural resources will again become available after decommissioning of the facility.
- Impacts on Heritage resources could be permanent without mitigation.
- The potential impacts on river systems, drainage channels and wetlands will be minimal because they are excluded from the development footprint with sufficient buffers. Impacts on these resources can be reversed successfully.
- Socio-economic impacts can be reversed at the decommissioning phase, though this will have a nett negative effect on the area.

9.5.2 DEGREE TO WHICH IMPACTS MAY CAUSE IRREPLACEBLE LOSS OF RESOURCES

The only impact which can cause an irreplaceable loss of resources is an impact on the heritage resources where heritage sources are destroyed. This should not happen as the heritage resources are well surveyed and protected from development impacts. The archaeological site as identified on the Florida Solar Park development site has been classified as having a very low significance. An application to obtain a destruction permit will be submitted to SAHRA for the destruction of the area and the subsequent archaeological finds. No development will be allowed to take place in this are unless the relevant permit has been obtained from SAHRA.

9.5.3 DEGREE TO WHICH IMPACTS CAN BE AVOIDED, MANAGED OR MITIGATED

It is not possible to completely avoid the impacts of the development on the environment. By following the mitigation and management measures detailed in the impact section in this report, most of the impacts and the effects it can have on the environment can be successfully lowered to a lower degree of significance to the environment. This can be done to a point where the impacts are acceptable and where the benefits of the development are greater than the detriment to the environment.

9.6 HIGH LEVEL RISK ASSESSMENT FOR BESS TECHNOLOGY

Batteries store electrical energy in chemical form. The range of electrochemical technologies include:

- a) batteries with solid electrolyte, as Lithium-ion batteries; and
- b) batteries with liquid electrolyte, as Na–S battery, Lead–Acid (PbA) battery, nickel - cadmium (Ni–Cd) battery or other types of liquid metal batteries.

A Li-ion battery cell is a sealed article, with a typical voltage of 3.6V DC per cell and it is an article with no intended release of its substances.

The preferred technology for the Battery Energy Storage System (“BESS”) is **Lithium-ion battery cells**, which will be pre-assembled at the supplier factory and installed in the containers prior to delivery to the site. Lithium-ion cells technology offers the highest energy density (compared to the other cell technologies), does not suffer from memory effect and is low maintenance. Typical lithium-ion cells used for BESS hold a solid rechargeable electrolyte (the energy accumulator), therefore they don’t hold any liquid or gas. The main benefit of solid ceramic electrolytes is that there is no risk of leaks, which is a serious safety issue for batteries with liquid electrolytes.

A BESS does not emit any gas to the atmosphere during construction and/or normal operation. The containers of the batteries are equipped with a firefighting system conceived to effectively detect smoke and high temperatures and automatically activate the extinguishers to prevent fire. Furthermore, the external metallic surface of the cells is conceived to resist to fire.

The preferred technology is therefore Lithium-ion battery cells with solid rechargeable electrolyte.

Under normal conditions of use, the battery does not release its content as it is sealed. In case of accidental release of the batteries components, please refer to the emergency response guidance below)

In case of large electrical serial assembly, modules and full battery may offer high Voltage hazard (> 36 Volts).

The presence of the High Voltage warning sign requires dedicated intervention equipment:



The primary focus is on the fire hazards associated with Li-ion batteries and potential for a condition known as “thermal runaway”. Thermal runaway results from **internal shorts** inside a battery cell which occur due to a variety of reasons and **can ultimately lead to the battery catching fire.**

The following measures will reduce the fire risk to an acceptable level:

- The Battery Management System should include an approved device to preclude, detect, and control thermal runaway.
- The BESS should incorporate appropriately certified inverters/inverter systems and must comply with other recognised safety standards which address risk assessment and controls.
- The BESS must be located well away from critical buildings or equipment and located in a non-combustible enclosure. Sufficient clearance should be maintained around the installation to provide for fire service access.
- Clear signage should be visible to include warnings of a possible fire hazard.

- An approved, monitored, automatic smoke detection system must be installed at the BESS. A fire suppression system must be designed and installed at the BESS.
- Regular inspections must be undertaken to ensure the battery systems are not overheating.
- Portable fire extinguishers must be provided at the BESS.
- Installations should have emergency power disconnects to ensure manual, remote, and local disconnect is possible adjacent to the BESS.
- The BESS must have an online condition monitoring system. The system should be fitted with temperature monitoring which incorporates a high temperature alarm for the battery room and container. Temperatures should be monitored at a constantly attended location.

Additional general recommendations to prevent and manage potential contamination of water resources in the BESS area:

- Compilation and adherence to a procedure for the safe handling of battery cells.
- Lithium-ion batteries must have battery management systems (containment, automatic alarms, and shut-off systems) to monitor and protect cells from overcharging or damaging conditions, such as temperature extremes.
- Compilation of an Emergency Response Plan for implementation in the event of a spill of electrolyte from the batteries.
- Provision of spill kits on-site for clean-up of spills and leaks.
- Immediate clean-up of spills and disposal of contaminated absorbents and materials or soil at a licensed hazardous waste disposal facility.
- Recording and reporting of all significant electrolyte spills so that appropriate clean-up measures can be implemented. A copy of these records must be made available to authorities on request throughout the project lifecycle.
- Frequent and appropriate disposal of any hazardous waste to prevent pollution of soil and groundwater.
- On-site battery maintenance should only be undertaken on impermeable surfaces with secondary containment measures. Any resulting hazardous substances must be disposed of appropriately.
- Provision of suitable emergency and safety signage on-site, and demarcation of any areas which may pose a safety risk (including hazardous substances). Emergency numbers for the local police, fire department, Eskom and the Local Municipality must be placed in a prominent clearly visible area on the site.
- Dispose of waste batteries in accordance with national legislation. When collected waste batteries must undergo recycling to comply with national regulations. Batteries should not be disposed of into the environment.

Safe handling advice

- When handling the batteries (cells), use personal protective equipment (non-conductive gloves), specifically to avoid short-circuits between the battery poles.

Technical measures/precautions

- Follow the instructions reported in the user's manual prepared by the manufacturer.
- Do not short (+) or (-) battery terminals with conductors, do not allow battery terminals to contact each other.
- Do not use unadopted charging systems.
- Do not reverse the polarity,
- Do not mix different types of batteries or mix new and old ones together e.g., in a power pack,
- Do not open the battery system or modules,
- Do not use the unit without its electronic management system,
- Do not submit to static electricity risks to avoid damages to the protecting electronic circuit,
- Do not submit to excessive mechanical stress,
- Do not expose the battery to water or humidity (avoid water condensation),
- Do not expose to heat. Unsuitable use can cause leakage or evacuate through a safety valve gaseous electrolyte fume that may cause fire,
- Immediately disconnect the batteries and isolate in a safe place if, during operation, they emit an unusual smell, develop heat, change shape/geometry, or behave abnormally. Contact the manufacturer if any of these problems are observed.

Storage

- Keep in a dry, cool and well-ventilated place, check the recommended storage temperature usually reported in the user's manual prepared by the manufacturer, (e.g., 35°C),
- Keep away from heat sources (max 60°C) and sources of ignition. Protect from direct exposure to sunlight.
- Keep away from water and condensation.
- Store in closed container and packaging, in such a way to prevent short circuits and damages during storage or transportation. Packaging qualified for transport is generally suitable for storage.
- In case of risk of thermal runaway during storage or transport, it is necessary to use strong outer packaging as recommended by the UN Special Provision 376 to restrict the potential ejection of cells constituents and battery parts during fire.
- In case of mixed storage of goods and articles, organize separate storage area for lithium-ion batteries and maintain 2.5m between the Lithium-ion batteries storage area and other goods.
- Store in limited quantities and in isolated area under external surveillance, unless stored in a specifically designed storage building (detectors and/or sprinklers protection systems).
- Infra-Red cameras may be used to detect any excessive temperature raise in stored quantities, e.g., > 85°C.

Potential hazard by damaged lithium batteries *in absence of fire* is mainly a release of electrolyte containing corrosive salts. Measures must be taken to protect operators from inhaling volatile organic substances. Reaction of electrolyte with water/humidity may generate hydrofluoric acid and irritate eyes, nose, throat and skin.

Personal precautions

- Use personal protective equipment.
- Avoid contact with skin and eyes.
- Ventilate the area.
- Position yourself in the wind direction.

Environmental precautions

- Eliminate all possible sources of heat or ignition.
- Prevent further leakage or spillage if safe to do so (use absorbent cloth or other inert absorbent non-conductive mineral such as sand, sodium bicarbonate, alumina or vermiculite).
- Dry clothes can also be used as a absorbent material in absence of fire.
- Do not allow material to contaminate ground water system.

The information below refers to exposure to the substances contained in the battery.

Call for emergency services. Consider and decide about the adapted intervention plan (ACTIVE/PASSIVE Response, proximity, or distance response).

In active response, (with fire)

- Large flow of water can be used to **reduce the temperature of the batteries** and stop the fire reactions inside the batteries. Specific care should be taken for large and compact batteries, where cooling may require more time.
- Foam and specialized products can be used to reduce access of oxygen to the fire and stop flames but are generally less efficient than cooling down the batteries. Be aware of the risk of re-ignition until the batteries have been cooled down below 100°C.

In passive response, control extension of fire to neighbour materials and buildings

- Use abundant flow of water to cool down cells or batteries adjacent to the ones that have caught fire (maintain low temperature) whatever the type of batteries at the origin of the fire.
- The first responders need to be informed that in case of fire there is a risk of ejection of projectiles from the battery.

Suitable extinguishing media

- Water (see below)
- Specialized products, liquid foam, carbon dioxide (CO²), sand, vermiculite.

Warning/risk for the use of water

- If water is used on active batteries, caution should be taken to avoid the electrical hazard that may be present (in case of high voltage battery, > 36 Volts).
- The decision to use large amount of water is depending on the local circumstances (water retentions systems, environment risks, etc.)
- In case of fire including large Lithium metal or Lithium metal polymer batteries, the use of water may increase the energy /heat release.
- In such case, stop the use of water and allow the energetic fire of the battery for 15 minutes.
- Protect or cool with water the surrounding areas to avoid propagation of the fire.

Treatment of Wastewater

- Confine the effluent or the contaminated material and collect it further as hazardous waste (water) for appropriate treatment.
- Pick up and transfer to properly labelled containers.
- Dispose of in accordance with local waste management legislation and emissions regulations

9.7 METHODOLOGY USED IN RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL IMPACTS AND RISKS ASSOCIATED WITH ALTERNATIVES

To assess the impacts on the environment, the process will be divided into two main phases namely the Construction phase and the Operational phase. The activities, products and services present in these two phases will be studied to identify and predict all possible impacts. In any process of identifying and recognising impacts, one must recognise that the determination of impact significance is inherently an anthropocentric concept. Duinker and Beanlands, (1986) in DEAT 2002. Thompson (1988), (1990) in DEAT 2002 stated that the significance of an impact is an expression of the cost or value of an impact to society.

However, the tendency is always towards a system of quantifying the significance of the impacts so that it is a true representation of the existing situation on site. This will be done by using where possible, legal and scientific standards which are applicable.

The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The consequence matrix uses parameters like severity, duration and extent of impact as well as compliance to standards. Values of 1-5 are assigned to the parameters that are added and averaged to determine overall consequence. The same process is followed with the likelihood that consists of two parameters namely frequency and probability. The overall consequence and the overall likelihood are then multiplied to give values ranging from 1 to 25. These values as shown in the following table are then used to rank the significance.

It must be said however that in the end, a subjective judging of an impact can still be done, but the reasons for doing so must be qualified.

The formulas for calculating Consequence, Likelihood and Significance are provided below.

Table 28. Consequence and likelihood formulas

<ul style="list-style-type: none"> • Consequence = severity + duration + extent + compliance / 4 	(C = s + d + e + c / 4)
<ul style="list-style-type: none"> • Likelihood = frequency + probability / 2 	(L = f + p / 2)
<ul style="list-style-type: none"> • Significance = Consequence x Likelihood 	(S = C x L)

Table 29. Consequence and likelihood values

Consequence		
Severity		
Low	Low cost/high potential to mitigate. Impacts easily reversible, non - harmful insignificant change/deterioration or disturbance to natural environments	1
Low-medium	Low cost to mitigate Small/ potentially harmful Moderate change/deterioration or disturbance to natural environment	2
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change/ deterioration or disturbance. to natural environment	3
Medium-high	High cost to mitigate. Possible to mitigate Great/Very Harmful Very significant change/deterioration or disturbance to natural environment	4
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely Harmful Disastrous change/deterioration or disturbance to natural environment	5
Duration		
Low	Up to one month	1
Low-medium	One month to three months	2
Medium	Three months to one year	3
Medium-high	One to ten years	4
High	Beyond ten years	5
Extent		
Low	Within the proposed footprints	1
Low-medium	Within the application farms	2
Medium	Within surrounding farms	3
Medium-high	Within Local Municipalities areas	4
High	Within District Municipality area	5
Compliance		
Low	Best Practise	1
Low-medium	Compliance	2
Medium	Non-compliance/conformance to Policies etc. - Internal	3
Medium-high	Non-compliance/conformance to legislation etc. - external	4
High	Directive, prosecution of closure or potential for non-renewal of licences or rights	5
Likelihood		
Frequency		
Low	Once/more a year or once/more during operation	1
Low-medium	Once/more in 6 months	2
Medium	Once/more a month	3
Medium-high	Once/more a week	4
High	Daily	5
Probability		
Low	Almost never/almost impossible	1
Low-medium	Very seldom/highly unlikely	2
Medium	Infrequent/unlikely/seldom	3
Medium-high	Often/Regularly/Likely/Possible	4
High	Daily/Highly likely/definitely	5

Table 30. Significance ratings (Plomp 2004)

Significance	Low -	Low-Medium -	Medium -	Medium-High -	High -
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

Significance	Low +	Low-Medium +	Medium +	Medium-High +	High +
Overall Consequence X Overall Likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

9.8 ASSESSMENT CRITERIA

The terms of reference for the EIA study will include criteria for the description and assessment of environmental impacts. These criteria are drawn from the *Integrated Environmental Management Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts*, published by the DFFE in terms of the Environmental Impact Assessment. These criteria include:

Table 31. Impact Assessment Criteria

Nature of impact This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, and how.		
Extent The physical and spatial size of the impact.	Site	The impact could affect the whole, or a measurable portion of the above-mentioned properties.
	Local	The impacted area extends only as far as the activity, e.g. a footprint.
	Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
Duration The lifetime of the impact; this is measured in the context of the lifetime of the proposed base.	Short term	The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases.
	Medium term	The impact will last up to the end of the phases, where after it will be entirely negated.
	Long term	The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter.
	Permanent	The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
Intensity	Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
	Medium	The affected environment is altered, but function and process continue, albeit in a modified way.
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Probability This describes the likelihood of the impacts occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time.	Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design, or experience.

	Probable	There is a possibility that the impact will occur to the extent that provisions must be made therefore.
	Highly probable	It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.
	Definite	The impact will take place regardless of any prevention plans, and there can only be relied on mitigation actions or contingency plans to contain the effect.
Determination of significance. Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.	No significance	The impact is not substantial and does not require any mitigation action.
	Low	The impact is of little importance but may require limited mitigation.
	Medium	The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
	High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

9.9 CUMULATIVE IMPACTS

Cumulative impacts will be assessed in relation to other renewable energy developments in the proximity from the proposed Florida Solar Park. Mitigation measures will be proposed, to mitigate the impacts that may result from the establishment of the Florida Solar Park to an acceptable level.

The general approach to this study has been guided by the principles of Integrated Environmental Management (IEM). In accordance with the IEM Guidelines issued by the DEA, an open approach, which encourages accountable decision-making, was adopted.

The principles of the IEM require:

- informed decision-making.
- accountability for information on which decisions are made;
- a broad interpretation of the term “environment”;
- an open participatory approach in the planning of proposals.
- consultation with I&APs;
- due consideration of alternatives;
- an attempt to mitigate negative impacts and enhance positive impacts of proposals;
- an attempt to ensure social costs of developments are outweighed by social benefits;
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation, and decommissioning of proposals; and
- the opportunity for public and specialist input in the decision-making process.

Method and process used for assessment of cumulative impacts at Florida Solar Park:

Step 1: Initiate the process by identifying possible cumulative impacts of the proposed project on the surrounding environment at the project location. The possible cumulative impacts can be selected based on information related to current or anticipated future conditions, the occurrence of protected species or habitats, and the presence or anticipated presence of other human activities that would (adversely) affect the same environment. Once the possible cumulative impacts have been selected, they should be subject to each of the following five steps.

Identified possible cumulative impacts:

- Visual impact
- Loss of Agricultural Resources
- Loss of Biodiversity
- Increase in Traffic Impact
- Increased positive Socio-economic Impact

Step 2: Identify other past, present, and reasonably foreseeable future actions within the space and time boundaries that have been, are, or could contribute to cumulative effects in the area. Based on this knowledge, identify appropriate spatial and temporal study boundaries.

- Visual impact
- Loss of Agricultural Resources
- Loss of Biodiversity
- Increase in Traffic Impact
- Increased positive Socio-economic Impact

Step 3: For the identified cumulative impacts, assemble appropriate information and describe and assess the historical to current conditions of the area. The historical information should coincide with the selected past temporal boundary (or historical reference point). Further, and depending upon the availability of information, any identified trends in the conditions of the area should be identified.

Step 4: Numerous types of tools could be used to establish either descriptive or quantitative connections. Predictions related to future cumulative impacts, resulting from multiple actions may be problematic due to the absence of detailed information; however, identification of changes in the environment and their indicators can be useful. Finally, emphasis should be given to the anticipated cumulative impacts.

Step 5: Assess the significance of the cumulative effects. Such significance determinations should begin with the incremental effects (the direct and indirect effects) of the proposed development on the directly surrounding areas. The concept of environmental sustainability (including social and economic sustainability) could be considered both in relation to incremental effects and cumulative effects.

Step 6: For negative incremental impacts from the proposed project and for which the cumulative effects are significant, develop appropriate action-specific mitigation measures for such impacts. Further, if significant cumulative effects are anticipated consideration should be given to multi-stakeholder collaboration to develop joint cumulative effects management measures, either locally or regionally, or both. Finally, multi-stakeholder collaboration in follow-up activities can be both cost-efficient and an aid in local and regional planning.

Environmental Assessment Framework and Cumulative Effects Assessment (A tool to be used as referred to in Step 4):

1. Scoping
2. Analysis
3. Mitigation
4. Significance
5. Follow-up

9.10 POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY

- The positive impact that the development will have on the environment and community is a Socio-economic impact. It will create temporary jobs during the construction phase and permanent jobs during the operational phase than the current farming activities.
- The PV Solar Park will help to reduce the pressure on the Eskom grid in the country with far fewer negative impacts on the natural resources of the area than in the case of power generation using other sources like coal, gas, water, and nuclear energy.
- The PV Park will have a low negative impact on agriculture because no croplands, only grazing, will be affected.
- The PV Park will have a low to medium negative impact on biodiversity because of vegetation clearance and habitat destruction.
- The PV Park and power lines will have low negative impacts on birds.
- The PV Park will have a low negative impact on traffic along the R37 road.
- During the operational phase the PV Solar Park and power lines will have a low negative impact on the visual environment around the PV Facility.

9.11 POSSIBLE MITIGATION MEASURES AND RESIDUAL RISK

- Sheep can be allowed to graze under the PV panels that will reduce the residual risk significantly.
- Sensitive biodiversity areas, drainage channels and wetlands will be excluded from the proposed development. The drainage channels, dam, and stream east of the PV Park will sustain ecological corridors through and around the project.
- Bird diverters, bird guards, and spirals must be placed along the entire proposed powerline to reduce fatalities of large terrestrial birds and raptors.
- Intersection improvements as stipulated in Table 3.1 of the Traffic Impact Assessment must be implemented for to reduce the residual safety risk.

- The proposed Florida Solar Park & Power Line would have a **medium significance** for all visual receptors, during all phases of the project, with or without the correct and effective implementation of the proposed mitigation measures except when mitigation measures are implemented correctly and effectively in the decommissioning phase, then the rating would drop to **low-medium**.

9.12 CONCLUDING STATEMENT INDICATING THE PREFERRED ALTERNATIVE AND LOCATION OF ACTIVITY

The preferred alternative was selected because of the following reasons:

- It will have the smallest impact on the environment having been located on the least sensitive areas, avoiding croplands, streams drainage channels and wetlands.
- Negative impacts on the avifauna will be low.
- Active croplands have been excluded from the PV Park footprint.
- Heritage sites with of significance will be avoided.
- There are no tourism attractions close by that will be visually negatively affected.
- Access to the PV Park will be from the traversing R37 road with a low impact on traffic.
- The project will not interfere or impact the Obstacle Limit Surfaces and the Approach/Departure Surfaces of Harmony Mine and Beatrix Mine airports.
- The PV Park and power line will be in line with Eskom requirements for connection to the Theseus substation.

The negative impacts including the *cumulative* impacts can be effectively mitigated and managed to reduce the negative effect the impacts would have on the environment, so that the positive effects of the socio-economic impact and renewable energy generation will offset the negative effects of the development.

10 DESCRIPTION OF THE PROPOSED PROCESS TO IDENTIFY AND RANK ENVIRONMENTAL IMPACTS THAT THE ACTIVITY, ASSOCIATED STRUCTURES AND INFRASTRUCTURE WILL IMPOSE ON THE PREFERRED LOCATION THROUGH THE LIFE OF THE ACITIVITY

An environmental impact is defined as a change in the environment, be it the physical/chemical, biological, cultural and or socio-economic environment. Any impact can be related to certain aspects of human activities in this environment and this impact can be either positive or negative. It could also affect the environment directly or indirectly and the effect of it can be cumulative.

10.1 DESCRIPTION OF ENVIRONMENTAL ISSUES AND RISKS IDENTIFIED DURING THE EIA PROCESS

The potential aspects that were assessed during the EIA process included:

- Soils & agricultural potential
- Biodiversity aspects
- Wetlands aspects
- Avifauna aspects
- Heritage resources aspects
- Palaeontological aspects
- Socio-economic aspects
- Traffic aspects
- Civil aviation aspects
- Radio Frequency Interference aspects
- Visual aspects

The **decommissioning activities** of the PV plant mainly include the removal of the project infrastructure and the restoring of the site *status quo ante*.

The identification of impacts will be based on:

- legal and administrative requirements;
- the nature of the proposed activity;
- the nature of the receiving environment;
- specialist studies; and
- issues raised during the public participation process.

Potential impacts include:

- Impacts on soils & agricultural potential.
- Impacts on avifauna.
- Impacts on vegetation.
- Impacts on heritage resources.
- Social impacts.
- Visual impacts.

The following possible Key environmental impacts were identified:

ENVIRONMENTAL ISSUES	POSSIBLE CAUSE	POTENTIAL IMPACTS
Air Pollution and noise		
Dust	<ul style="list-style-type: none"> • Construction machines and vehicles during clearing and construction of the PV Solar facility. 	<ul style="list-style-type: none"> • Health problems • Air pollution • Public nuisance
Emissions	<ul style="list-style-type: none"> • During operation of construction equipment. • Spraying of insecticides and herbicides during operation. • During veld fires. 	
Noise	<ul style="list-style-type: none"> • Construction noise. 	
Water quality		
Pollution of water sources Pollution by <i>E.coli</i>	<ul style="list-style-type: none"> • Spillages of fuel & oil from vehicles during construction. • Pollution from solid general waste if not removed regularly. • By using insecticides and herbicides. • Poorly planned and managed sanitation facilities. 	<ul style="list-style-type: none"> • Pollution of surface and groundwater • Health risk • Lower water quality • Soil degradation
Water quantity		
Impact on amount of water resources available Over-use of water	<ul style="list-style-type: none"> • Use of water during construction of the PV solar facility. • Water use during operation. 	<ul style="list-style-type: none"> • Loss of a scarce resource • Increased pressure on water supply sources
Land/Soil degradation		
Soil contamination and degradation	<ul style="list-style-type: none"> • Spillages of oil, chemicals from machinery and vehicles during construction. • Site clearing during construction. • Use of Pesticides and Fertilizers. • Loss of Agricultural potential of soil. • Erosion if storm water is not correctly managed. 	<ul style="list-style-type: none"> • Pollution of soil • Soil degradation • Loss of topsoil • Effect soil characteristics, ecology & groundwater • Loss of topsoil
Biodiversity		
Decline in fauna and flora diversity	<ul style="list-style-type: none"> • Clearing of site for construction. • Loss of habitat due to construction of panels. • Power lines to Eskom substation. 	<ul style="list-style-type: none"> • Loss of biodiversity • Loss of habitat • Negative impact on biodiversity • Negative impact on rare / endangered/ endemic species and habitats • Animal deaths.

ENVIRONMENTAL ISSUES	POSSIBLE CAUSE	POTENTIAL IMPACTS
Cultural/Heritage		
Possible loss of heritage sites Damage to palaeontological resources	<ul style="list-style-type: none"> • Damage during construction or operation. 	<ul style="list-style-type: none"> • Possible loss of cultural heritage sites paleo-resources
Visual impact		
Change in the visual characteristics of the site	<ul style="list-style-type: none"> • Clearing of vegetation for panels. • Presence of Solar facility. 	<ul style="list-style-type: none"> • Visual intrusion
Socio-economic impacts		
Job creation	<ul style="list-style-type: none"> • Increase in temporary and permanent work opportunities during the construction and operational phases. • Loss of land available for farming without fair compensation. 	<ul style="list-style-type: none"> • Socio- economic benefit

10.2 IMPACTS & MITIGATION MEASURES OF CONSTRUCTION AND OPERATIONAL PHASE

All the possible impacts that can be predicted in both the construction and operational (limited) phase of the PV Solar Park are addressed. Specific mitigation measures are proposed, and the significance of these impacts is described with and without the mitigation measures. Furthermore, considering that all or part of the construction infrastructure may be owned and/or operated by Eskom, the mitigation measures described in the following paragraphs and in the attached Environmental Management Programme (EMPr) can become the responsibility of Eskom or of the developer.

10.2.1 ATMOSPHERIC POLLUTION AND NOISE

Construction Phase

During this phase there will be a concentration of earthmoving equipment and construction vehicles that will level the area, clear vegetation for construction purposes and in the process, will create dust and exhaust smoke that will impact on air quality. There will also be more noise created by the vehicles during this phase. Burning of waste and fires at construction sites can also create smoke.

Operational phase

The increased traffic volumes and people will lead to increased levels of air pollution and noise. Smoke from burning of waste can cause air pollution.

Project Phase	Impact Atmospheric Pollution and noise									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Earthworks and Vegetation clearance	Air pollution Dust	Low-medium	Medium	Medium	Low-medium	High	High	Low-medium	Medium
	Vehicle movement	Air pollution: Smoke	Low	Medium-high	Low	Low	High	High	Low	Low-Medium
	Vehicle movement	Air pollution: Dust	Low	Medium-high	Low-medium	Low-medium	High	High	Low-medium	Medium
	Vehicle movement	Noise pollution	Low	Medium-high	Low	Low-medium	High	High	Low	Low-Medium
	Burning of cleared vegetation, solid waste & veld fires	Air pollution by excessive smoke	Low-medium	Low	Medium	Low-medium	Low-Medium	Low	Low	Low-Medium
	Cooking fires of workers	Air pollution: Smoke	Low	Medium-high	Low	Low-medium	Low-Medium	Medium	Low	Low
Operation	Vehicle movement	Noise pollution	Low	High	Low-medium	Low-medium	High	Medium-high	Low-medium	Medium
	Veldt fires	Air pollution caused by smoke	Medium	Low	Medium	Low-medium	Low	Medium-high	Low	Low-Medium
	Burning of vegetation refuse and solid waste	Air pollution by excessive smoke	Low-medium	Low	Low-medium	Low-medium	Low-Medium	Low-medium	Low	Low
Cumulative impacts	Dust formation & Noise during construction phase	Increase in release of dust and increase in noise levels	Low	Medium-high	Low-medium	Low-medium	Medium-high	High	Low	Low-Medium

Mitigation measures - Construction Phase

- Vehicles must be well serviced to prevent excessive smoke and noise.
- Speed of construction vehicles should be kept as low as possible (20-30km/h) to reduce generation of dust and noise.
- Construction areas must be dampened/treated to prevent excessive dust formation. This would lower the cumulative impact of dust formation.
- From a road safety perspective, on-site dust suppression of the proposed access roads (if gravel road) should be conducted when required to avoid road visibility issues caused by dust from vehicles making use of the road, which could lead to vehicle accidents.
- The clearing of the site should be done in phases as the construction progresses.
- Construction should only take place during the hours between sunrise and sunset on weekdays and Saturdays.
- Contractors must comply with provincial noise regulations. The construction machinery must be fitted with noise mufflers and be maintained properly. This would lower the cumulative impact of noise during this phase.
- Solid waste generated by the construction teams will not be burned on site or the surrounding areas but be regularly removed to the municipal waste disposal site.
- Fire belts must be made around the development according to the regulations of the Veld and Forest Fire Act.
- The cleared vegetation must be stock-piled and should be removed at regular intervals to a composting plant. The cleared vegetation must not be burned on site.
- Cooking at construction site should not be done on open fires. Gas stoves can be used.

Mitigation Measures - Operational Phase

- Speed of vehicles on roads should be controlled e.g., speed bumps and speed restrictions (20-30km/h), with visible signage.
- All roads should preferably be treated with chemicals to eliminate dust formation caused by strong winds and vehicle movement.
- Solid waste must not be burned on the project area.
- Fire belts around the development must be made according to the regulations of the Veld and Forest Fire Act.
- Vegetation underneath the panels must be kept short (grazing by sheep or slashing).
- Vegetation refuse should be composted if possible.

During operation the cumulative impact of dust generation and noise is low. Comparatively, agricultural activities would create more dust and noise.

10.2.2 LAND AND SOILS

Construction phase

During construction, the vehicles used have the potential to spill diesel and lubricants that can pollute the soil. The storage of solid waste before it can be disposed of has the potential to pollute the soil and becomes a nuisance.

The cumulative impact of possible soil erosion can be increased with the development.

Operational phase

Solid waste can be a nuisance and has the potential to pollute the soil if not managed correctly. The use of conventional fertilizers, herbicides and insecticides should be limited as far as possible. Wastewater from activities can pollute the soil.

Project Phase	Impact: Land and soils									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Spilling of oil/diesel by construction machines or tanks	Contaminate soil	Low-medium	Medium-high	Low	Low	Medium	Medium-high	Low	Low-Medium
	Spilling of chemicals/sewage	Contaminate soil	Low-medium	Medium-high	Low	Low	Medium	Medium-high	Low	Low-Medium
	Solid waste disposal	Soil pollution & nuisance	Low	Medium-high	Low-medium	Low-medium	Medium-high	Medium-high	Low	Low-Medium
	Storm water over roads and cleared areas	Erosion	Low-medium	Medium-high	Low-medium	Low-medium	Low-Medium	Medium-high	Low	Low-Medium
	Trenches for electric cables and water and sewerage pipes	Erosion	Low-Medium	Medium-high	Low	Low-medium	Low-Medium	Medium	Low	Low-Medium
	Moving of equipment over soils	Compaction of soils	Low-Medium	Medium-high	Low-Medium	Low	High	High	Low-Medium	Medium
	Using land for solar facility	Sterilising of Agricultural land	Low-medium	High	Low	Low-medium	High	High	Medium	Medium

Project Phase	Impact: Land and soils									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Operation	Solid waste	Soil pollution + nuisance	Low	High	Low-Medium	Low	High	Medium-high	Low	Medium
	Storm water from cleared areas, roads and solar panels	Erosion	Low-medium	High	Low-medium	Low-medium	Low-Medium	Medium	Low	Low-Medium
	Use of fertilizers, insecticides and herbicides	Pollution	Low-Medium	High	Low-Medium	Low-medium	Medium	Medium-High	Low	Low-Medium
Cumulative impacts	Increased potential for negative impacts on soil resource	Increased potential for erosion and soil pollution	Low-Medium	High	Low-medium	Low-medium	Medium	Medium-high	Low	Low-Medium
	Negative impacts on soil resource	Sterilise agricultural land	Low-Medium	High	Low-Medium	Low-medium	High	High	Medium	Medium

Mitigation measures - Construction Phase

- Clearance of vegetation should be restricted to the footprint areas.
- Construction activities should be restricted to the proposed development footprints.
- Construction vehicles must be well maintained and serviced to minimise leaks and spills.
- Spill trays must be used during refuelling of vehicles on site.
- Temporary diesel storage must not exceed 30 000 litres at construction camp. Diesel tanks and other harmful chemicals and oils must be within a bunded area and water from this bunding must be channelled through an oil/water separator.
- Solid waste must be kept in containers and disposed of regularly at licensed dumping site.
- Building rubble must be removed to a licensed disposal site regularly during construction.
- Trenches that are dug for the supply of services and electrical cables must be filled up and compacted well and slightly higher than the areas around it.
- The clearing of the site should be done in phases as the construction progresses.
- Slopes produced by removing soil must be kept to a minimum to reduce the chances of erosion damage to the area.
- During construction, sensitive soils with high risk of compaction (e.g., clayey soils) must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts.
- Institute a storm water management plan including temporary and permanent erosion control plans.
- Minimise bare areas-revegetate as soon as possible to prevent soil erosion and mitigate the cumulative effect of erosion.

Mitigation measures - Operational Phase

- Solid waste must be kept in adequate waste bins and removed on a weekly basis to the waste disposal site.
- The surface drainage system should be monitored after storms and storm water damage should be repaired. The maintenance of the roads must be kept up to standard to prevent and reduce the incident of erosion next to the roads.

- The use of eco-friendly products e.g., organic compost, herbicides and insecticides should be promoted and should only be used according to the specifications.
- Revegetate bare areas to minimise soil erosion and mitigate this cumulative impact in the area.

10.2.3 GROUNDWATER AND SURFACE WATER POLLUTION

Construction phase

- Lack of sanitation facilities could result in ground water pollution and associated health risks.
- Construction vehicles that will be refuelled at the construction camp.
- Spillage of fuel and lubricants from construction vehicles could occur. Storm water contamination by solid waste could lead to groundwater and surface water pollution.
- Soil cover and vegetation is removed and storm water in the area can cause erosion. Road construction will increase a possibility of erosion, because of increased storm water run-off.

Operational Phase

- Pollution by sanitation system leakages, solid waste and erosion can lead to water pollution. Storm water run-off over open areas can cause erosion.
- Storm water flowing over polluted areas could lead to ground and surface water pollution.
- Fertilizers, pesticides, and herbicides used at the project during operation can create pollution if not handled and applied correctly.
- Cumulative impacts could be a concentration of water runoff during rain events.

Impact: Groundwater and Surface water Pollution										
Project Phase	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Spillage of fuel and lubricants from construction vehicles & fuel tanks	Groundwater Pollution	Low-Medium	Medium-high	Medium	Low-medium	Medium	Medium-high	Low	Low-Medium
	Clearing of vegetation	Erosion & siltation of streams	Low-Medium	Medium-high	Medium	Low-medium	Low-Medium	Medium-high	Low	Low-Medium
	Solid waste disposal	Pollution of freshwater resources	Low	Medium-high	Low-Medium	Low-medium	High	Medium-high	Low-medium	Medium
	Sanitation seepage from chemical toilets and/or from the temporary sanitation system	Groundwater Pollution	Low-Medium	Medium-high	Low-medium	Low-medium	Medium	Medium	Low	Low-Medium
Operation	Spillage of fuel and lubricants from vehicles	Groundwater Pollution	Low-Medium	High	Low-medium	Low-medium	Medium-high	Medium-high	Low-medium	Medium
	Solid waste disposal	Groundwater Pollution	Low	High	Low-medium	Low	Low	Low-medium	Low	Low-Medium
	Leakage from the permanent Sanitation system	Groundwater Pollution	Low-Medium	High	Low-Medium	Low	Low-Medium	Low-Medium	Low	Low-Medium
	Use of fertilizers, insecticides and herbicides	Pollution of streams & rivers	Low-Medium	High	Low-Medium	Low-medium	Medium	Medium-High	Low	Low-Medium
	Storm water runoff	Erosion & siltation of streams	Low-medium	High	Low-medium	Low-medium	Medium	Medium-high	Low	Low-Medium

	Cooling water for fire/thermal runaway at BESS	Pollution of surface and Groundwater	Low-Medium	High	Low-Medium	Low	Low-Medium	Medium	Low	Low-Medium
Cumulative impacts	Water pollution and increased water run-off	Increased potential for water pollution and water run-off	Low-Medium	High	Low-Medium	Low-medium	Medium-High	Medium-high	Low	Medium

Mitigation measures – Construction phases

The following precautionary measures are recommended to prevent any surface or groundwater pollution:

- Clearance of vegetation should be restricted to footprint area.
- Construction activities should be restricted to the proposed footprint area.
- Cleared areas should be rehabilitated by reintroducing a grass layer to limit soil erosion.
- Berms to limit water flow over cleared areas, to limit erosion.
- Drip pans should be used during re-fuelling and servicing of construction vehicles. Used parts like filters should be contained and disposed of at a site licensed for dumping of these waste products.
- Oil traps must be installed in the vehicle wash bay to prevent pollution. Oil traps must be serviced on a regular basis by an approved service agent.
- Diesel storage must not exceed 30 000 litres at construction camp. Diesel tanks and other harmful chemicals and oils must be within a bunded area. Any water from out of this bunding must flow through an oil/water skimmer.
- Chemical/temporary sanitation facilities at construction site must be regularly serviced to ensure no spills or leaks to surface and/or groundwater.
- Solid waste must be kept in adequate waste bins. Building/construction waste and various waste products must be removed regularly to a licensed landfill site.

Mitigation measures - operational phase

- Solid waste must be kept in adequate waste bins and removed on a weekly basis to a licensed landfill site.
- The use of eco-friendly products e.g., organic compost, herbicides and insecticides should be promoted.
- A permanent closed, sewage treatment system to treat effluent to the required standards of the DWS must be installed at the solar facility.
- The permanent sanitation system should be regularly inspected to ensure that no spills or leaks from sanitation system to groundwater take place.
- Storm water run-off from the site must be managed in such a way that erosion of the area is not caused by water accumulated on the site.
- Water used for extinguishing a fire or thermal runaway at BESS must be contained and disposed of or treated at a Hazardous waste facility.

10.2.4 WATER USE / WATER QUANTITY

Construction phase

During this phase, water consumption will be the highest because it will be utilized for gravel roads and building construction. The water needed for the construction activities will be provided from boreholes.

Operational phase

Water use will be limited except for short periods when the PV modules will be cleaned.

Project Phase	Impact: Water use									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Construction process	Water consumption	Low-medium	Medium-High	Medium	Low	High	High	Low-Medium	Medium
Operational	Water use & cleaning of panels	Water consumption	Low	High	Medium	Low	High	High	Low-Medium	Medium
Cumulative impacts	Water use	Increased pressure on local water resources	Low-Medium	High	Medium	Low	High	High	Low-Medium	Medium

Mitigation measures – Construction Phase

- Water must be used sparingly, and it should be ensured that no water is wasted.
- Roads should be treated with chemicals to lower water use for dust suppression.
- Washing of construction vehicles should be limited to once or twice a month and must be done with high-pressure sprayers to reduce water consumption.
- Water use in construction must be managed in such a way that there is no wastage of water as a resource.

Mitigation measures - Operational Phase

- Cleaning of panels should be done only when necessary to limit the impact on water resources.
- Roads should be treated with chemicals to lower the use of water for dust suppression.
- Washing of vehicles should be limited to once a week and must be done with high-pressure sprayers to reduce water consumption.
- Care must be taken not to waste any water. In the offices, half-flush systems in the toilets as well as water aerators in all taps must be installed to reduce water consumption.
- Personnel must be educated on the value of water and how to use it sparingly.

10.2.5 ARCHAEOLOGICAL, CULTURAL AND SOCIAL FEATURES

Construction phase

The clearing of the site may have a negative impact on the archaeological features of the site. Care must be taken in the excavations and moving of soil to observe any other archaeological, previously undetected, features of importance, which must be left and reported to the archaeological consultant for comments and actions.

Operational phase

The operational phase will not have any negative impact on the archaeological features of the site if the recommendations of the Heritage Impact Assessment and Palaeontological assessment are strictly adhered to.

Project Phase	Impact: Loss of Archaeological, Cultural and social features									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Earth moving and soil clearance	Destroy archaeological evidence and heritage.	Medium	High	Low	Low	Medium-High	Low-medium	Low	Low-Medium
	Earth moving and soil clearance	Impact on Palaeontological resources	Medium	High	Low	Low	Medium-High	Low-medium	Low	Low-Medium
Operation	Operational activities of development	Destroy archaeological evidence and heritage and graves	Low-medium	High	Low	Low	Low	Low	Low	Low
Cumulative impacts	Activities on site during construction and operation	Increase in potential to unearth archaeological evidence and graves	Medium	High	Low	Low	Medium-High	Low-medium	Low	Low-Medium

Mitigation measures – Construction and operational phases

- Two settlement areas dating to the Historical Period were noted in the proposed Florida Solar Park area (**Site FSP-HP01, Site FSP-HP02**). The sites are poorly preserved and of low heritage significance. Site clearing and construction activities such as excavations and may expose previously undetected artefacts, structures or human remains and site monitoring by an informed ECO will be required throughout the construction phase of the project.
- A stone-built ruin occurs approximately 80m east of a south-western portion of the Florida Solar Park project area (**Site FSP-HP03**) and it must be ensured that this ruin is not impacted during construction.
- It is not feasible for a specialist monitor to be continuously present at the earth works and therefore, personnel must be involved in mitigation by watching for fossils.
- Follow the steps outlined in the Chance Find Protocol in the Paleontological report if any fossilised remains are found.
- The ECO must contact the palaeontologist or archaeologist contracted to be on standby in the case of finds. The latter will liaise with SAHRA on the nature of the find and suitable consequent actions, must be taken, such as an immediate site inspection and/or application for a palaeontological collection permit.
- Care must be taken during the construction process that anything else of archaeological value that is unearthed must be recorded. Please refer to the Heritage Impact Assessment (Annexure H). The archaeologist or SAHRA must be notified whenever anything of importance is discovered.

10.2.6 IMPACT OF THE DEVELOPMENT ON ECOLOGY (FAUNA & FLORA) OF THE AREA

Planning and construction phase

The removal of natural vegetation and destruction of habitat will have a negative effect on the biodiversity and is part of a cumulative effect together with other renewable energy development projects in the area. It is though partly on agricultural lands areas which has a LOW -MODERATE agricultural potential. The specific mitigation measures included in the Ecological and Avifauna Impact Assessment (Annexures D & E) should be adhered to.

Operational phase

Operation of the development can have a negative impact on biodiversity if not managed correctly. Exotic invasive plant species can have negative impacts on indigenous vegetation.

Project Phase	Environmental Aspect: Ecology (Fauna and Flora)									
	Activity that causes impact	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Earthworks and vegetation clearance at construction site	Loss of indigenous species & disturbance to sensitive habitat	Medium	High	Low	Low	Medium	High	Low-Medium	Medium
	Vegetation clearance and movement of people on the site at different development areas	The introduction and spreading of exotic invasive plant species	Low-Medium	Medium	Low-Medium	Low-Medium	Medium-High	Medium-High	Low	Low-Medium
	Vegetation clearance and construction activities	Impact on avifauna	Medium	High	Low-Medium	Low	Medium	High	Low-Medium	Medium
	Construction activities close or in sensitive areas	Impact on wetlands and drainage channels	Medium	High	Low-Medium	Low	Medium	Medium-High	Low	Low-Medium
	Littering (e.g. cans and plastics) along access road and at construction site	Public nuisance and loss/death of indigenous fauna	Low-Medium	Medium-High	Medium	Low-Medium	High	Medium-High	Low	Medium
	Chemical pollution	Damaging or killing of species	Low-Medium	Medium-High	Low-Medium	Low	Medium-High	Medium	Low	Low-Medium
	Rehabilitation of cleared areas	Spreading of exotic invasive plant species	Low-Medium	Medium	Low-Medium	Low-Medium	Medium-High	Medium-High	Low	Low-Medium
	The occurrence of veldt fires	The loss of indigenous fauna and flora	Medium-High	Medium	Medium	Low-Medium	Low	Medium	Low	Low-Medium
Operation	Loss of habitat	The loss of indigenous fauna and flora	Medium	High	Low	Low	Low	High	Low-Medium	Low-Medium
	The occurrence of veldt fires	The loss of indigenous fauna and flora	Medium-High	Medium	Medium	Low-Medium	Low	Medium	Low	Low-Medium
	Disposal and storage of solid waste and littering	The death/loss of indigenous fauna e.g. raptors, mammals and reptiles	Low-Medium	High	Low-Medium	Low	Medium-High	Medium	Low	Low-Medium
	The control of pests and vermin	Killing and poisoning of fauna feeding on poisoned vermin / pest	Low-Medium	High	Low-Medium	Low	Medium-High	Medium	Low	Low-Medium
	The feeding of fauna e.g. birds & small mammals	Disturbance to biodiversity and natural movement of animals through the site	Low-Medium	High	Low-Medium	Low	Medium-High	Low-Medium	Low	Low-Medium
	Catching of wild animals e.g. reptiles, birds and small mammals as pets	Disturbance to biodiversity and decline in indigenous faunal numbers	Medium-High	High	Low-Medium	Low	Medium	Low	Low	Low-Medium
	Birds colliding with power line and panels	Electrocution of birds	Medium	High	Low-Medium	Low	Medium	Medium	Low	Low-Medium
	The erection of fences and the construction of roads with a kerb	The fragmentation of available habitat and the restriction of movement of small mammals, reptiles and amphibians	Low-Medium	High	Low-Medium	Low-medium	High	Medium-high	Low	Medium
Cumulative Impacts	Increased potential negative impacts on ecology of the area	Increase in natural vegetation to be removed.	Medium-High	High	Medium	Low	Low	High	Low-Medium	Low-Medium

Project Phase	Environmental Aspect: Ecology (Fauna and Flora)									
	Activity that causes impact	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
	Birds colliding with power line and panels	Electrocution of birds	Medium	High	Medium	Low	Medium	Medium	Low	Low-Medium

Mitigation measures – Construction phase

- Pylons must be placed outside sensitive areas (wetlands, pans, drainage lines and riparian habitat) as far as possible.
- In sensitive areas, tower assembly must take place off-site or away from sensitive positions.
- All areas to be developed must be walked through prior to any activity to ensure no animal species are found in the area. Should any Species of Conservation Concern be found and not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.
- Clearance of vegetation and construction activities must be restricted to footprint area and access roads.
- The vegetation associated with the water courses and wetlands has a high sensitivity with a high conservation priority. No major alteration of these important drainage areas is recommended. The potential to impact on the habitat is high and therefore a sufficient buffer zone of 32 meters is applicable from the development site to the flood line zone.
- All construction and maintenance activities should be conducted in such a way that minimal damage is caused to the drainage features on site. No development can be done within the flood line zone without a Water Use Licence, except if outside the 1:100-year flood line or 100 meters from the delineated riverine areas or 500 meters from the wetlands.
- Speed limit of 30 km/h must be enforced on the roads.
- Care must be taken that unnecessary clearance of vegetation does not take place. Where possible, natural vegetation (grass and herb layer) must be retained to limit this impact.
- The herbaceous layer should be revived after clearance of the vegetation and actively managed through slashing during the entire lifetime of the project. Small animals like sheep could also graze beneath the panels.
- Herbicides used to control invasive plant species should be chosen in consultation with an ecologist, as some of the agents might be detrimental to the surrounding indigenous fauna and flora e.g. Roundup is for example extremely toxic to frogs.
- Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist.
- Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.
- “Critter tunnels” must be placed for a variety of small fauna that might occur in the area, with specific reference to its size and placing (aboveground / underground).
- Speed limit of 20-30km/h on site to avoid collisions with night birds and twilight

- active birds.
- All the parts of the infrastructure must be bird nest proofed and anti-perch devices placed on areas that can lead to electrocution.
- All probable and high-risk perching surfaces should be fitted with bird guards and perch guards as deterrents.
- Where possible the installation of artificial bird space perches or platforms at a safe distance from energised components
- Only power lines structures that are considered safe for birds should be erected to avoid the electrocution of birds (particularly large raptors) perching or attempting to perch.
- Overhead transmission cables should be marked with bird diverters to make the lines as visible as possible to collision-susceptible species.
- Fires should only be allowed at designated places within the construction camp and extra care should be taken to prevent veldt fires of occurring.
- Firebreaks should comply with the National Veldt and Forest Fire Act, 1998 (Chapter 4: Duty to Prepare and maintain firebreaks).
- Cleared areas should be rehabilitated by reintroducing a vegetation layer as soon as possible to limit the occurrence of erosion.
- The cleared vegetation must not be burned on site.
- Solid waste must be kept in adequate animal proof waste bins at the construction camp and construction sites. Building rubble and various wastes should be removed on a regular basis to the closest available landfill site.
- Regular clean-up programs should be put into effect along the access road and throughout the premises to limit the impact of littering caused by construction activities.
- Stockpiled topsoil and construction material should be managed in such a way that the material is not transported by wind or rain. This can be done by restricting the height of the stockpiles, sandbagging, and avoiding steep slopes.
- No animals must be killed, captured, or hunted on site by construction workers. Do not feed any wild animals on site.
- Where trenches pose a risk to animal safety, they must be adequately cordoned off to prevent animals falling in and trapped and/or injured. This can be prevented by constant excavating and backfilling of trenches during construction process.
- The EMPr will have to be adhered to during the construction phase and regular monitoring should be done to ensure that there is sound environmental practice at the Florida Solar Park.

Mitigation measures – Operational phase

- The herbaceous layer should be revived after clearance of the vegetation and actively managed through slashing during the entire lifetime of the project to limit open soils which is prone to erosion.
- An ecologist should be consulted on the use of herbicides/eco-friendly products to control exotic tree and shrub species.
- Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist.
- Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for all applications.
- High-risk sections of the power line from the Solar Park should be marked with a

- suitable anti-collision marking device on the earth wire as per Eskom guidelines.
- Report all incidences of collisions of birds with panels.
- Speed limit of 20-30 km/h on site to avoid collisions with night birds and twilight active birds.
- Regular monitoring of powerlines should be undertaken to detect bird carcasses, to enable identification of areas of high impact to be marked with bird diverters.
- Solid waste must be kept in animal proof waste bins.
- A monitoring program should be compiled and implemented to ensure that the sewage treatment system is functioning properly and that the treated wastewater conforms to the standards set by the Department of Water and Sanitation (DWS).
- Staff members should be discouraged from attempting to catch or kill any wildlife for use as food, pets or to feed any wild animals.
- Firebreaks should comply with the National Veld and Forest Fire Act, 1998.
- Outside lighting must be designed and limited to minimize impacts on avifauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (red/green) motion detection lights must be used wherever possible.
- The impact on the flying invertebrates and night birds must be minimized using sodium vapour (red/green) motion detection lights.
- A follow-up assessment on avian biodiversity and species abundance within the assessment area and surrounding areas must be conducted within one year after the facility has been in operation and should be repeated every 3-5 years. Information obtained from the monitoring must be provided to BirdLife Renewable Energy Programme on **energy@birdlife.org.za**.
- The use of eco-friendly products e.g., organic compost and/or Effective Microorganisms (EM), which reduces the frequency of application of conventional fertilizers, herbicides, and insecticides, should be promoted.

10.2.7 VISUAL IMPACTS

Construction phase

The natural aesthetic character of the site will be changed. However, the local communities will be informed of the development stages and impacts on them during the construction phase.

Operational phase

Buildings and the solar modules have a visual impact to surrounding properties and to the sensitive viewers around the project site and lights at night can be a nuisance.

Project Phase	Impact: Visual disturbance									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Buildings& panels	Visual	Low-Medium	High	Medium	Low	High	High	Medium	Medium
	Lights	Visual	Low-Medium	High	Medium	Low	High	High	Low-Medium	Medium

Project Phase	Impact: Visual disturbance									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Operation	Buildings and panels	Visual	Low-Medium	High	Medium	Low	High	High	Medium	Medium
	Lights	Nuisance	Low-Medium	High	Medium	Low	High	High	Low-Medium	Medium
Cumulative Impacts	Increased visibility of another solar park in the area	Increased visual intrusion and nuisance	Medium	High	Medium	Low	High	High	Medium	Medium

Mitigation measures

- During the field work and impact assessment it was noted that the existing vegetation would play a minimal role in screening the proposed project components from VSRs. However, care should still be taken to:
- Retain as much of the existing vegetation as possible.
- Where vegetation is cleared, a rehabilitation plan should be implemented. This should be done in conjunction with Vegetation, Visual Impact and any other relevant specialists.
- Even though this is a dry climate It is still good practice to minimise the clearance of existing vegetation to minimise the need for re-vegetating efforts, and exposed surface soil. Implement correct and effective storm-water management measures that would reduce the potential and amount of erosion around the project components. This would also result in reducing the loss of valuable topsoil and vegetation habitat.
- It is assumed that construction activities would be limited to daylight hours. With regards to the construction camp:
 - o Refrain from causing ‘light spillage’ beyond the construction camp by installing light fixtures with directional illumination.
 - o Keep lighting to a minimum by installing low-level bollard type lights instead of post top lights along walkways between buildings.
 - o Where possible avoid high flood lights, and instead use lower locally lit installations.
 - o In general, lighting should be carefully directed and only be used where absolutely necessary.
 - o Should construction activities extend during night-time, adhere to the same recommendations as for the construction camp.
- Keep travelling speeds along unpaved roads within the site work area as low as possible to avoid creating dust clouds.
- Structures should be painted in a manner that mimics the hues of existing vegetation, specifically the warehouses, workshops and control buildings associated with the substations.
- A video-surveillance system using infrared or microwave video cameras, which do not need a switched-on lighting system, is recommended. These facilities should be carefully considered to minimize visual impacts i.e. they should be located ‘in rhythm’ with other project components.

10.2.8 SAFETY, HEALTH, SECURITY AND FIRE HAZARDS

Construction phase

Construction activities such as excavating of foundations and trenches, movement of construction vehicles, the use of equipment and the congregation of workers and staff on site increases the risk of injury. The activities of construction personnel on site may contribute to an increase in the level of crime in the area and may also contribute to an increased fire risk.

Operational phase

Fires and criminal activities pose a significant risk during the operation of the development.

Project phase	Impact: Safety, , Health, Security and Fire hazards									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Construction activities – excavation of foundations, trenches etc.	Loss or injury to human life	Medium-High	High	Low	Low	High	Medium-High	Low	Medium
	Health issues	Spreading of diseases	Medium-High	High	Low	Low	Medium-High	Low-Medium	Low	Low-Medium
	Security	Crime	Medium-High	High	Low-medium	Low	Low-Medium	Medium	Low	Low-Medium
	Veldfires	Loss of human life and construction equipment etc.	Medium-High	Low	Medium	Low-Medium	Low-Medium	Medium-High	Low	Low-Medium
	Fire hazards from BESS	Loss of human life and construction equipment etc.	Medium-High	Low	Medium	Low	Low	Low-Medium	Low	Low
Operation	Security	Crime	Medium-High	High	Low-medium	Low	Low-Medium	Medium	Low	Low-Medium
	Fire hazards at Panels and BESS	Loss of human life, biodiversity, buildings, infrastructure etc.	Medium-High	Low	Medium	Low	Low	Low-Medium	Low	Low
Cumulative Impacts	Higher number of people in the area increases safety risks	Potential for an increase in criminal activity	Medium-High	High	Medium-High	Low-Medium	Medium	Medium-High	Low-Medium	Medium

Mitigation measures – Construction phase

- The Contractor shall conform to the Occupational Health and Safety act (Act 85 of 1993) and regulations applicable. The Act requires the designation of a Health and Safety representative when more than 20 employees are employed.
- Mitigation measures is required in the form of equipment design and on-site security. To ensure the panels and equipment are well protected.
- A security fence should be constructed along the boundary of the development.
- Contractors must ensure that all the health protocols of the time are followed.
- Open trenches or excavations must be marked with danger tape or safety netting and must be filled and compacted as soon as possible.
- Number of construction workers to stay on site should be limited to the minimum.
- Proper access control (I.D. cards) should be enforced to ensure that no authorised persons enter the site.

- No solid waste or vegetation must be burnt on the premises or surrounding areas.
- Firebreaks must comply with the National Veldt and Forest Fire Act, 1998 (Chapter 4: Duty to prepare and maintain firebreaks).
- The fire management plan must include management protocols to ensure that the surrounding natural environment will not be affected by an unplanned fire sourcing from the facility.
- The BESS must incorporate appropriately certified inverters/inverter systems and must comply with other recognised safety standards which address risk assessment and controls.
- The BESS must be well away from critical buildings or equipment and located in a non-combustible enclosure. Sufficient clearance should be maintained around the installation to provide for fire service access.
- Advisory and warning signage must be visibly displayed.
- An approved, monitored, automatic smoke detection system must be installed at the BESS. A fire suppression system must be designed and installed at the BESS.

Mitigation measures – Operational phase

- Proper access control (I.D. cards) should be enforced to ensure that no authorised persons enter the site.
- No solid waste or vegetation must be burnt on the premises or surrounding areas.
- Firebreaks must comply with the National Veldt and Forest Fire Act, 1998 (Chapter 4: Duty to prepare and maintain firebreaks).
- Fire extinguishers and fire-fighting equipment must be available especially to be able to combat fires at the BESS.
- The Battery Management System must include an approved device to preclude, detect, and control thermal runaway.
- Regular inspections must be undertaken to ensure the battery systems are not overheating.
- Installations should have emergency power disconnects to ensure manual, remote, and local disconnect is possible adjacent to the BESS.
- The BESS must have an online condition monitoring system. The system must be fitted with temperature monitoring which incorporates a high temperature alarm for the battery room and container. Temperatures must be monitored at a constantly attended location.
- The fire management plan must include management protocols to ensure that the surrounding natural environment will not be affected by an unplanned fire sourcing from the facility.
- Personal protective equipment must be issued to personnel working at the BESS to protect them against, shock, inhalation of vapours and contact with chemical substances especially when there is a fire hazard.

10.2.9 TRAFFIC AND ROAD SAFETY

Construction phase

Trip generation during the construction phase will be much higher than during operational phase. It is assumed that construction will take 18 months. If 10% of the trips occur in the peak hour approximately 4 trucks will arrive and leave in the peak hour. Private vehicles will also be used by construction supervision and admin staff to access the site as well as the construction workers who will arrive via bus or taxi.

Operational phase

During the operational phase, the facility will be managed by staff supported by admin and maintenance personnel. These are low traffic volumes (<20vph) that will have an insignificant impact on the road network surrounding the proposed development. Dedicated turn lanes will improve road safety at the intersection.

Project phase	Impact: Traffic and Road Safety										
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance		
									With Mitigation	Without Mitigation	
Construction & Operation	Construction activities – Increase in traffic	Higher volume of vehicle trips could contribute to a higher rate of deterioration of road surfaces	Low-Medium	High	Low-Medium	Low	High	Medium-High	Medium	Medium	
	Road Safety Issues	Development access from provincial road creating accidents possibility	Medium	High	Low-medium	Low	Medium	Medium	Low	Low-Medium	
	Road Safety Issues Public transport	Loading and off-loading of visitors and workers by public transport/ arranged shuttle transport could lead to the unsafe manoeuvres by vehicles at intersections it could lead to fatal vehicle accidents.	Medium	High	Low-Medium	Low-Medium	Medium - High	High	Low-Medium	Medium	
Cumulative Impacts	Construction activities – Increase in traffic	High volume of vehicle trips could contribute to a higher rate of deterioration of road surfaces	Low-Medium	High	Low-Medium	Low	High	Medium-High	Medium	Medium	
	Road safety issues	Accidents, and injuries or fatalities to road users	Medium	High	Low-Medium	Low	High	High	Low-Medium	Medium	

Mitigation measures

- The following intersection improvements are recommended in Table 3.1 of the Traffic Impact Assessment with regards to intersection improvements:
 - o Point A
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.
 - Relocate existing Western Farm Access Road (Point A-2) to Point A.
 - It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point A will only be used occasionally by maintenance staff.
 - o Point B
 - Provide 60 metres dedicated right-turn lane on the northern approach of Road R73.
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.

- It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point B will function as the main access to the Proposed Florida Solar Park.
 - Point C
 - Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark.
 - Provide relevant road traffic signs and road markings.
 - Relocate existing Southern Farm Access Road (Point 4) to Point C.
 - It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point C will only be used occasionally by maintenance staff.
- As part of the construction phase of the proposed Florida Solar Park, a dedicated loading and off-loading area on site should be established where workers can safely be loaded and off-loaded by public transport or arranged transport.
- Approval for the position and geometric layout for the proposed access intersections (Points A, B & C) from and to Road R73 should be obtained from the Free State Department of Police, Roads, and Transport as part of the detailed design phase.

10.2.10 SOCIO-ECONOMIC IMPACT

Construction phase

The construction and operation phases of the development will have a positive impact on the socio-economic environment of beneficiary communities through employment opportunities and training and skills development.

Operational phase

Several permanent jobs will be created for local people during this phase.

Project phase	Impact: Socio-economic impact									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Compliance	Frequency	Probability	Significance	
									With Mitigation	Without Mitigation
Construction	Job creation	Job Creation (160 jobs)	High +	High +	Medium -High +	Low-Medium +	High +	High +	N/A	High +
	Solar energy value chain	Boost local business for solar components	High+	Medium -High	High	Low-Medium +	High+	High+	N/A	High+
	Crime	Possible rise in crime levels in area	Medium-	High-	Medium -	Low-	Medium -	Medium -High	Low-Medium-	Medium-
Operation	Local Community /businesses development	Local Community development	High +	High +	Medium -High +	Low-medium +	High +	High +	N/A	High +
	Contribute power to the National Grid	Reduce load shedding periods	High+	High	High	Low-medium +	High+	High+	N/A	High +

	Investment of R4bn.	Foreign investment in country and province	High+	High+	Medium-High+	Low-Medium+	Low+	High+	N/A	Medium +
	CO ² Emissions	Reduce CO ² Emissions opposed to coal power stations	High+	High+	High+	Low+	High+	High+	N/A	High +
	Permanent Job Creation	55 new permanent jobs created	High +	High +	Medium-High +	Low-Medium +	High +	High +	N/A	High +
	Vandalism	Possible theft of solar panels	Medium-	Low-Medium -	High-	Low-	Low-	Low-	Low	Low
Cumulative impacts	Job creation.	Increased potential for local Community development	High +	High +	Medium-High +	Low-Medium +	High +	High +	N/A	High +

Mitigation measures

- During the construction and operational phases, jobs must be created for unemployed local people and skills must be transferred to them.
- Security: Mitigation measures will be required in the form of equipment design and on-site security for protection of assets.
- Where viable, the work must be executed in a labour-intensive manner to create as many jobs as possible.
- The cumulative impact of this impact can just be positive. As one of the larger provinces in South Africa, the Free State Province needs more job opportunities.

10.3 ASSESSMENT OF POTENTIALLY SIGNIFICANT IMPACTS AND RISKS

Impacts with a rating of Medium-high or High are impacts which are regarded as potentially significant, rated without any mitigation measures. In this impact assessment, NO impacts were regarded as potentially significant impacts.

11 SUMMARY AND FINDINGS AND RECOMMENDATIONS OF SPECIALIST REPORTS AND HOW FINDINGS HAVE BEEN INCLUDED IN THE ASSESSMENT REPORT

The main issues identified because of the specialist studies include the following:

- Visual impacts
- Soil erosion (wind and water)
- Impact on biodiversity (flora & fauna)
- Impact on avifauna
- Impact on wetlands, drainage channels and riparian vegetation
- Impact on loss of agricultural land
- Damages to heritage sites
- Impacts on paleontological finds
- Impacts on traffic safety
- Impacts on aviation

SPECIALIST	FINDINGS	RECOMMENDATIONS
<p>Landscape Architect: Visual Impacts</p>	<ul style="list-style-type: none"> • The main characteristics of the study area includes mining, crop and livestock farming. Tourist attractions mostly occur on the outer edges of the study area, 20km radius, with the closets being the Allemanskraal Dam, approximately 16km South-East of the nearest solar park site, on the outer edge of the visual analysis. • The residential component of the study area includes farmstead with associated workers housing as well as the towns of Virginia and Ventersurg and the townships of Meloding and Mmamahabane. • Visually Sensitive Receptors within the study area with a high sensitivity comprised of residential type receptors including: farmsteads with associated residences, the town of Virginia and the township of Meloding, agricultural holdings, clusters of residences and other small communities; tourist attractions including game farms, of which the Willem Pretorius game reserve is the largest, guest houses and events locations as well as historical landmarks including the Sandrivier Convention Memorial Stone as well as the N1 National road due to its prominence as a national road linking the Southernmost tip of Africa to the rest of the continent. • VSRs with the largest anticipated impact include the residences on the farm Welgelegen No. 382, located just over 400m and approximately 3,2km to the southwest of the proposed new layout of the Florida power line. For the nearest farmstead the visual impact relevance of the impact would be substantial. Views would however include the existing power line, located just over 550m from the viewer, which would form part of the backdrop of the view. Existing buildings and vegetation would partially screen the proposed project components from the viewer. The anticipated impact 	<ul style="list-style-type: none"> • During the field work and impact assessment it was noted that the existing vegetation would play a minimal role in screening the proposed project components from VSRs. However, care should still be taken to: <ul style="list-style-type: none"> - Retain as much of the existing vegetation as possible. - Where vegetation is cleared, a rehabilitation plan should be implemented. This should be done in conjunction with Vegetation, Visual Impact and any other relevant specialists. • Even though this is a dry climate It is still good practice to minimise the clearance of existing vegetation to minimise the need for re-vegetating efforts, and exposed surface soil. Implement correct and effective storm-water management measures that would reduce the potential and amount of erosion around the project components. This would also result in reducing the loss of valuable topsoil and vegetation habitat. • It is assumed that construction activities would be limited to daylight hours. With regards to the construction camp: <ul style="list-style-type: none"> - Refrain from causing 'light spillage' beyond the construction camp by installing light fixtures with directional illumination. - Keep lighting to a minimum by installing low-level bollard type lights instead of post top lights along walkways between buildings. - Where possible avoid high flood lights, and instead use lower locally lit installations. - In general, lighting should be carefully directed and only be used where absolutely necessary. • Should construction activities extend during night-time, adhere to the same recommendations as for the construction camp. • Keep travelling speeds along unpaved roads within the site work area as low as possible to avoid creating dust clouds.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<p>has been mitigated by using one instead of the originally proposed four power lines. The newly proposed Florida 400kV substation is located approximately 2,0km, 2,7km, and 4,0km from the farmsteads on the farm Welgelegen, the substation would be located in the background of views from these key viewpoints and include views of various existing power lines.</p> <ul style="list-style-type: none"> The proposed Florida Solar Park & Power Line would have a medium significance for all visual receptors, during all phases of the project, with or without the correct and effective implementation of the proposed mitigation measures except when mitigation measures are implemented correctly and effectively in the decommissioning phase, then the rating would drop to low-medium. This is due to the duration and frequency of the exposure to the impact, i.e. where there are views of the proposed project components, they will 'always' be visible for the duration of the project life time. 	
<p>Soil Specialist: Soil Potential assessment</p>	<ul style="list-style-type: none"> The nature of the soil makes the potential to cultivate crops under arable conditions marginal, even though some areas of the site is currently used for maize cultivation. Although the soil texture and depth are suitable for arable agriculture, the climatic conditions (annual rainfall 560mm) render the soils marginal for arable agriculture. Considering that re-growth of grass will take place under the panels as the mounting systems are at least 1m above ground level, the grazing value of the land will still be available to small livestock such as sheep. 	<ul style="list-style-type: none"> Unnecessary soil compaction must be avoided. Minimize the area of land disturbance. Erosion and dust control measures to be implemented. Storm water management plan to be implemented. Exposed, bare soil must be minimized. Topsoil to be conserved and maintained where possible. Store chemicals on impervious area Soil pollution to be avoided and prevented. Treat spillages according to correct procedures Stockpile topsoil separately from subsoil Restrict development to specific areas.
<p>Archaeologist: Archaeology and graves</p>	<ul style="list-style-type: none"> Two settlement areas dating to the Historical Period were noted in the proposed Florida Solar Park area 	<ul style="list-style-type: none"> Site monitoring by an informed ECO will be required throughout the construction phase of the project at FSP-HP01 and FSP-HP02.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<p>(Site FSP-HP01, Site FSP-HP02). The sites are poorly preserved and of low heritage significance. Site clearing and construction activities such as excavations may expose previously undetected artefacts, structures, or human remains.</p> <ul style="list-style-type: none"> • A stone-built ruin occurs approximately 80m east of a south-western portion of the Florida Solar Park project area (Site FSP-HP03) and it is unlikely that the site will be impacted by the development. 	<ul style="list-style-type: none"> • Site FSP-HP03 must be protected from construction activities.
<p>Paleontological specialist</p>	<ul style="list-style-type: none"> • The proposed site lies on the moderately fossiliferous Quaternary sands and alluvium and the potentially highly fossiliferous Adelaide Subgroup that could preserve vertebrate fossils such as therapsids, fish, amphibians and parareptiles of the Daptocephalus Assemblage Zone. The site visit and walk through on 19 January 2023 by palaeontologists confirmed that the area has been or is being used for agriculture and the fields have been ploughed. • There were no rocky outcrops, and NO FOSSILS present on the land surface. Given the lack of surface outcrop, there is only a very small chance that there is outcrop in the soils below the surface. • Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further paleontological impact assessment is required unless fossils are found by the contractor, developer, environmental officer or other designated responsible person once excavations or drilling activities have commenced. Since the impact will be low to moderate, as far as the paleontology is concerned, the project should be authorised. 	<ul style="list-style-type: none"> • 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 below the ground surface in the shales of the Adelaide Subgroup so a Fossil Chance Find Protocol should be added to the EMPr. • If fossils are found by the contractor, environmental officer, or other responsible person, once excavations and drilling have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample.

SPECIALIST	FINDINGS	RECOMMENDATIONS
<p>Avifauna specialist: Impact on biodiversity (bird collisions)</p>	<ul style="list-style-type: none"> • The assessment area consisted of four avifauna habitats; transformed areas, degraded grassland, grassland and bushclumps. These habitats were still mainly in a natural state except for the regions disturbed by livestock grazing and transformed due to anthropogenic activities. Three SCC were confirmed in the assessment area (Blue Korhaan (<i>Eupodotis caerulenscens</i>), Lanner Falcon (<i>Falco biarmicus</i>) and Secretarybird (<i>Sagittarius serpentarius</i>)). Some high-risk avifauna species were recorded from the project area and surrounding, including raptors and water birds. • The project will result in habitat loss and degradation of avifaunal habitats. The development will lead to the clearing of vegetation and an alteration in the undeveloped nature of the area. Based on the high receptor resilience and the medium biodiversity importance, the assessment area was given low site ecological importance, with transformed areas having a very low site ecological importance (SEI). Even though, the overall sensitivity is considered to be low, the specialist strongly suggests a follow-up survey to confirm the low sensitivity at the end of the wet season. • The development will also lead to sensory disturbance, collision, and electrocution risks. Even though the latter three impacts can be effectively mitigated, the loss of habitat cannot be mitigated. Considering the number of applications and current solar plant developments in the area the cumulative impact is regarded as being high. • The mitigation hierarchy implemented in this report is as per the information provided in section 2(4)(a)(i) of NEMA as well as the overall policy on Environmental offsetting (Biodiversity Offset Guidelines, section 24 J 	<ul style="list-style-type: none"> • Servitudes must be maintained as a two-track with indigenous vegetation and a wide road must not be cleared between pylons during operation. • Outside lighting must be designed and limited to minimize impacts on avifauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (red/green) motion detection lights must be used wherever possible. • All construction and maintenance motor vehicle operators must undergo an environmental induction that includes instruction on the need to comply with speed limit (40 km/h), to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. • Schedule or limit (where feasible) activities during least sensitive periods (May – August), to avoid migration, nesting and breeding seasons. • All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna populations in the region. Noise should be limited at night and during dusk and dawn to avoid disturbing roosting birds. • All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the area. Should any Species of Conservation Concern be found and not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken. • The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). • Bird diverters or spirals must be added to the transmission line to reduce fatalities. • All the parts of the infrastructure must be nest-proofed and anti-perch devices placed on areas that can lead to electrocution. • Any exposed parts must be covered (insulated) to reduce electrocution risk. • Monitoring by an Avifauna specialist should take place between September and February so that mitigation measures can be adapted to ensure the

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<p>of NEMA, Sept 2021). The mitigation hierarchy includes first avoiding the impact, then minimising it, then rehabilitation, and then offsetting. Where the residual impact, even after mitigation, is high, then offsetting should only be considered. In this case, no impacts are high post-mitigation and according to available data, offsets will not be required. Mitigation measures have reduced most impacts to a Moderate or Low, which is considered within the limits of acceptable change.</p>	<p>development does not have a long-term impact on the SCCs in the area.</p> <ul style="list-style-type: none"> • A follow-up assessment on avian biodiversity and species abundance within the assessment area and surrounding areas must be conducted within one year after the facility has been in operation and should be repeated every 3-5 years. • Information obtained from the monitoring must be provided to BirdLife Renewable Energy Programme on energy@birdlife.org.za • Data must be presented as described in Jenkins, A.R., Ralston-Paton, S., & Smit-Robinson, H. (2017). <i>Best Practice Guidelines: Birds and Solar Energy: Guidelines for assessing and monitoring</i> the impact of solar power generating facilities on birds in southern Africa. <ul style="list-style-type: none"> - Raptor and larger ground birds: Drive transects & incidental - Passerines: Point counts - All species: Nest monitoring
<p>Terrestrial Biodiversity Specialist</p>	<ul style="list-style-type: none"> • No red data species was documented during the surveys on the footprint of the solar park development site. Ecological monitoring should however still be implemented during the construction phase and specific sensitive habitats (riparian) needs to be avoided to ensure that any potential red data species potentially missed during the field surveys are preserved and not potentially impacted on. • No protected tree species occur in the area. • The protected species <i>Boophane disticha</i> and <i>Helichrysum nudifolium</i> confirmed for the site. No eradication should be allowed without a permit. • Ten different Alien invasive and exotic plant species were recorded on the study area during the surveys. • A few fauna species included in the IUCN red data lists can potentially be found in the study area. The development would not have a significant impact on the above-mentioned red data fauna since adequate and natural habitat/vegetation would be available on the 	<ul style="list-style-type: none"> • A permit should be obtained from the authorities before any of the protected plants are eradicated. These plants should form part of a rescue and relocation program should the development activities impact on populations. • Natural vegetation removal should be kept to a minimum during any future construction activities and only vegetation on the footprint areas should be removed. The unnecessary impact on the surrounding vegetation types should be avoided as far as possible. Considering the footprint area to form part of an area that is degraded, the impact on the vegetation of the larger area would be low. • A detailed species rescue, relocation and re-introduction plan should be developed and implemented by a qualified person before any excavations or disturbance commence. • Mitigation measures and monitoring should be implemented should the development be approved. • Where trenches pose a safety risk, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. • No animals must be poached during the construction of the solar park. • Do not feed any wild animals on site.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<p>peripheral grassland and woodland habitats surrounding the development site.</p> <ul style="list-style-type: none"> • Provided that the proposed development is consistent with the sensitivity map, and guidelines and take all the mitigation measures into consideration stipulated in this report, the planned development can be supported. 	<ul style="list-style-type: none"> • Waste bins and foodstuffs must be scavenger proof. • Roads should be designed without pavements to allow for the movement of small mammals. • “Critter tunnels” must be placed for a variety of small fauna that might occur in the area, with specific reference to its size and placing (aboveground / underground).
<p>Wetland & Riparian Specialist</p>	<ul style="list-style-type: none"> • Two wetland types were identified on the site for the proposed solar and power line development namely: <ul style="list-style-type: none"> ○ Valleybottom wetland with channel ○ Depressions: <ul style="list-style-type: none"> ○ Exorheic depressions (man-made dams). ○ Endorheic depressions(pans). • The other drainage features on the proposed development footprint sites are classified as channels (rivers) with riparian woodland. The rivers are classified as Floodplain Rivers and Non-perennial drainage channels. 	<ul style="list-style-type: none"> • The vegetation associated with the water courses and wetlands has a high sensitivity with a high conservation priority. No major alteration of these important drainage areas is recommended, especially considering it to form part of an important catchment. The potential to impact on the habitat is high and therefore a sufficient buffer zone of 32 meters is applicable for the development site or the flood line zone. • All construction and maintenance activities should be conducted in such a way that minimal damage is caused to the drainage features on site. No development can be done within the flood line zone without a Water Use License, except if outside the 1:100-year flood line or 100 meters from the delineated riverine areas or 500 meters from the wetlands.
<p>Traffic Engineer</p>	<ul style="list-style-type: none"> • Overall, the road surface of Road R73 is in good condition based on visual inspection. • The road network-related impact from a road safety perspective in terms of intersection sight distances due to the Proposed Florida Solar Park access intersections (Points A, B, and C) would have a low significance due to the required intersection sight distances being sufficient at the proposed access intersections. • The road network-related impact from a road safety perspective in terms of the speed limit along Road R73 would have a low significance on the Proposed Florida Solar Park and no road safety-related mitigating measures in terms of the speed limit would be required. • The road network-related impact from a road safety perspective in terms of the need for dedicated right-turn and left-turn lanes along Road R73 as part of the 	<ul style="list-style-type: none"> • The following intersection improvements are recommended in Table 3.1 of the Traffic Impact Assessment with regards to intersection improvements: <ul style="list-style-type: none"> Point A <ul style="list-style-type: none"> ○ Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark. ○ Provide relevant road traffic signs and road markings. ○ Relocate existing Western Farm Access Road (Point A-2) to Point A. ○ It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point A will only be used occasionally by maintenance staff. Point B <ul style="list-style-type: none"> ○ Provide 60 metres dedicated right-turn lane on the northern approach of Road R73. ○ Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark. ○ Provide relevant road traffic signs and road markings.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<p>Proposed Florida Solar Park access intersection (Point B) would have a medium-high significance due to a potential increase in collisions (rear-end which could lead to fatalities), specifically, vehicles waiting within the main traffic flow lane of Road R73 to turn right into the Proposed Florida Solar Park if a dedicated right-turn lane on the northern approach of Road R73 at Point B is not provided. With the provision of the above-mentioned at the proposed access intersection (Point B), the impact from a road</p> <ul style="list-style-type: none"> • safety perspective in terms of the need for dedicated turning lanes would have a low significance. • The road network-related impact from a road safety perspective in terms of pedestrian movements with the proposed access intersections (Points A, B, and C) due to the Proposed Florida Solar Park would have a low significance as no pedestrian activity is expected along Road R73 due to the rural locality of the Proposed Florida Solar Park and limited public transport availability, and that no road safety-related mitigating measures in terms of pedestrian movement would be required. • The road network-related impact from a road safety perspective in terms of loading and off-loading of workers, specifically during the construction phase, as part of the Proposed Florida Solar Park would have a medium-high significance if a dedicated loading and off-loading area is not provided on site as part of the Proposed Florida Solar Park and workers are loaded and off-loaded within the road reserve of Road R73. With the provision of a dedicated loading and off-loading area on site as part of the Proposed Florida Solar Park and ensuring that contractors make use of the dedicated 	<ul style="list-style-type: none"> ○ It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point B will function as the main access to the Proposed Florida Solar Park. <p>Point C</p> <ul style="list-style-type: none"> ○ Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark. ○ Provide relevant road traffic signs and road markings. ○ Relocate existing Southern Farm Access Road (Point 4) to Point C. ○ It is important to take note that during the operational phase of the Proposed Florida Solar Park, Point C will only be used occasionally by maintenance staff. <ul style="list-style-type: none"> • As part of the construction phase of the proposed Florida Solar Park, a dedicated loading and off-loading area on site should be established where workers can safely be loaded and off-loaded by public transport or arranged transport. • Approval for the position and geometric layout for the proposed access intersections (Points A, B & C) from and to Road R73 should be obtained from the Free State Department of Police, Roads, and Transport as part of the detailed design phase.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	<ul style="list-style-type: none"> • area, the impact from a road safety perspective in terms of loading and off-loading workers would have a low significance. • It is furthermore possible to conclude that owing to the type and nature of the Proposed Florida Solar Park, it is expected that the activities as part of the construction and operational phases of the Proposed Florida Solar Park, will have a manageable impact on vehicle traffic during the construction and operational phases, as long as road infrastructure improvements such as loading and off-loading by public transport are implemented as indicated in Section 3.2 of the TIA. 	

12 ENVIRONMENTAL IMPACT STATEMENT

12.1 SUMMARY KEY FINDINGS OF THE EIA

It can be concluded that there will be environmental impacts including cumulative impacts because of the proposed development of the Florida PV Solar facility. However, all the impacts can be mitigated to an extent which would make the development possible. Most of the impacts can be avoided and potential impacted areas such as the heritage sites will be demarcated as no-go areas, therefore limiting the possible negative environmental impacts to an acceptable level.

13 FINAL PROPOSED ALTERNATIVES RESPONDING TO IMPACT MANAGEMENT MEASURES, AVOIDANCE AND MITIGATION MEASURES IDENTIFIED IN ASSESSMENT

The preferred alternative was identified after all possible negative impacts were mapped and demarcated as no-go zones.

To minimize negative environmental impacts, there are areas that are not available for future developments of any kind. To mitigate for most of the negative impacts, avoidance seemed to be the best option in terms of the main issues, including:

- Impacts on drainage channels
- Impacts on heritage sites

14 ASPECTS WHICH WERE CONDITIONAL TO THE FINDINGS OF THE ASSESSMENT BY THE EAP OR SPECIALISTS WHICH ARE TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

- A detailed, specialist geotechnical report, must be compiled prior to construction, detailing the ground conditions possible foundation problems and solutions on site.
- A geo-hydrological assessment must be conducted, before construction commences, as well as a hydro census, target generation and drilling exercise to develop boreholes for the proposed development.
- An application must be submitted for a Water Use License before the start of development.
- Plant species found on site, protected in terms of the Free State Nature Conservation Ordinance include *Boophane disticha* and *Helichrysum nudifolium*. No eradication of these species should be allowed without a permit.
- Permit for eradication of protected species must be obtained from: Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA).
- The drainage lines and wetland / pans must be avoided and access to these areas must be restricted.
- No development can be done within the floodline zone without a Water Use License, except if outside the 1:100-year floodline or 100 meters from the delineated riverine

areas or 500 meters from the wetlands.

- Exotic and/or invasive plant species found on site must be eradicated, according to the amended regulations (No. R280), March 2001 of the Conservation of Agricultural Resources Act 1983 (Act no. 43 of 1983). It is the legal duty of the land user / landowner to control invasive alien plants occurring on the land under their control.
- Conservation and monitoring protocols must be implemented, which must include a monitoring program, for the avifauna occurring in the area and the developer must liaise with Birdlife SA (BLSA) in this regard.
- Eskom-approved; bird friendly devices must be attached to the powerlines to avoid bird collisions.
- Recommendations by Landscape Architect must be adhered to minimize visual impacts.
- If anything of archaeological/paleontological significance is found, the archaeologist as well as SAHRA must be notified immediately.
- Inform staff of the need to watch for potential fossil occurrences and Chance Find Protocol to be implemented in the event of fossil occurrences.
- All recommendations by the traffic engineer must be implemented to minimize negative impacts on traffic.

15 ASSUMPTIONS UNCERTAINTIES AND GAPS IN KNOWLEDGE

Uncertainties could be limited by implementing a thorough ground-truthing process before construction commences.

It is assumed that the developer will always act responsibly towards the environment during the development and will always comply with the conditions of the environmental authorization.

16 REASONED OPINION FOR AUTHORISATION OF ACTIVITY AND CONDITIONS IN RESPECT OF THAT AUTHORISATION

It is the opinion of the EAP that the environmental impacts associated with the proposed development were identified and that the mitigation measures proposed to mitigate the negative impacts will decrease the environmental negative impacts to acceptable levels.

The EAP respectfully request that the Environmental Authorization be issued for the proposed Florida Solar Park.

Conditions to be included in the environmental authorization

The following conditions can be added to the conditions listed in Section 14.

- Appoint an environmental control officer on site during construction of the development to monitor the development for compliance with the conditions of the environmental authorization and the EMPr.
- Permits for protected plants that will be affected by the development and consequently must be removed from the construction area must be obtained.
- Invader plants must be controlled through removal and destroying the plants.
- Only vegetation inside the development footprint may be removed for construction.
- The development must stay clear of the identified heritage features found on the proposed site.
- Should any previously undetected surface or subsurface paleontological or archaeological material be exposed during development activities, all activities should be suspended, and the archaeological specialist should be notified immediately.
- Sanitary facilities for convenience may not be sited at least 100m from the nearest watercourse.
- Soil erosion control and storm water management must be put in place.
- A pre-construction walk-through of the final development footprint must be undertaken in order to locate and identify Species of Conservation Concern that can be translocated.
- Sensitive habitats in close proximity to the development footprint must be avoided or demarcated as No-Go area.
- Search and rescue plan, Alien Invasive Species Eradication plan and Rehabilitation plan compiled as part of the Draft EMPr must be included in the final EMP report.
- Suitable bird repelling structures and bird diverters must be considered to avoid collision of birds with the PV facility.

17 PERIOD OF ENVIRONMENTAL AUTHORISATION AND DATE OF CONCLUSION OF ACTIVITY

The period for which the EA is required is for 10 years from date of Environmental Authorisation.

The date on which the activity will be concluded is in 10 years from date of Environmental Authorisation. Post construction monitoring must be done for at least 2 years after finalisation of construction.

18 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

I, Anton von Well, appointed EAP for the proposed Florida Solar Park and connecting power line application for Environmental Authorization, hereby confirm:

- Correctness of the information provided in this report.
- All comments and inputs and responses from stakeholders and I&APs are included here.
- All inputs and recommendations from the specialist reports where relevant, are included.
- Any information provided by the EAP to interested and affected parties and responses by the EAP to comments or inputs made by Interested and affected parties will form part of the Final report.

Signed

Date...05/07/2023.....

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