GEOHYDROLOGY

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SOCIAL DEVELOPMENT

Final EIA Report 14/12/16/3/3/2/2297

PROPOSED CORONA SOLAR PARK ON THE FARMS TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DE DAM 27 VENTERSBURG RD, AND CONNECTING 132 kV POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE

Short name: Corona Solar Park

July 2023

Commissioned by: Corona Energy (Pty) Ltd

Document version 2.0 – Final

Compiled by A von Well

AGES Purpose with Passion

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Final EIA Report: **14/12/16/3/3/2/2297**

Prepared by

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Purpose with Passion

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Short name: Corona Solar Park

July 2023

PROJECT APPLICANT

Company name:	**Corona Energy (Proprietary) Limited (Reg. No. 2022/847612/07)**
Contact Person:	Mr Ernst Jordaan Burger
Physical Address:	Du Toit Mook Auditors, 49 14th Street, Menlo Park, 0044, Pretoria, South Africa
Postal Address:	P.O. Box 36588, Menlo Park, Pretoria, Gauteng, 0102
Telephone Number:	+27 (0) 082 449 7626
E-mail:	development@lewton.co.za

ENVIRONMENTAL ASSESSMENT PRACTITIONER

Company Name:	AGES Limpopo (Pty) Ltd (Reg: 2006/020831/07)
Contact Persons:	Mr. Anton von Well
Physical Address:	120 Marshall Street, Polokwane, 0699, South Africa
Postal Address:	P.O. Box 2526, Polokwane, 0700, South Africa
Telephone Number:	+27 (83) 557 6494 / +27 0(15) 291 1577
Fax Number:	+27 (15) 291 1577
E-mail:	avonwel@ages-group.com

A von Well
Senior Environmental Assessment Practitioner
Registered EAP (EAPASA Ref. 2019/934)

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	Department of Water and Sanitation (DWS)
	Department of Agriculture, Land Reform and Rural Development (DALRRD)
	Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)
Municipal Manager	Lejweleputswa District Municipality
Municipal Manager	Matjhabeng Local Municipality
Municipal Manager	Masilonyana Local Municipality
	South African Heritage Resources Agency (SAHRA)
	Eskom Land & Rights
	Registered Interested and Affected Parties (I&AP's)

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14/12/16/3/3/2/2297	19 July 2023	2.0	Final EIA Report

RESOLUTION OF THE EIA REPORT AND INVITATION TO COMMENT

Corona Energy (Pty) Ltd has appointed AGES Limpopo (Pty) Ltd as the independent environmental consultant to undertake the Scoping & Environmental Impact Assessment for the Corona Solar Park Facility, Free State Province. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations (as amended) promulgated in terms of the National Environmental Management Act, 1998 (NEMA; Act No. 107 of 1998).

This Final EIA Report represents the findings of the EIA process.

The Draft EIA Report was made available for public review for a period of 30 days for comments. The report was emailed via WeTransfer link to all registered Interested and Affected Parties and stakeholders. All comments received are recorded and responded to in a Comments and Responses Report and will be included in Annexure D of the Final EIA Report.

EXECUTIVE SUMMARY

Corona Energy (Pty) Ltd 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 will be located on the farm Tevrede 361, Ventersburg RD, Biddulph 329 Ventersburg RD and De Dam 27 Ventersburg RD.

The connecting power line, according to the proposed powerline alignment, will cross the following properties, within the "Powerline Study Corridor":

- Farm De Dam 27, Ventersburg RD;
- Farm Biddulph 329, Ventersburg RD;
- Remainder of the Farm Le Roux 766, Ventersburg RD;
- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD;

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

The proposed development area is approximately 508 ha and the Photovoltaic (PV) Power Plant, and its connection infrastructure consists of the installation of the following equipment:

- Photovoltaic modules (mono-crystalline, poly-crystalline, mono 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)
- A **new 132 kV power line (double circuit),** approximately **7.0 km long** for the connection of the on-site substation to the new Florida 132kV/400kV Substation, planned to be located on Portion 1 of the Farm Florida 633, Ventersburg RD (this 132kV/400kV substation is not part of the current EIA process)
- **Battery Energy Storage Systems (BESS),** with a Maximum Export Capacity up to 240 MW and up to 6-hour storage capacity of 1 440 MWh), with a footprint of 20 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

- Access road 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

Table 1. Technical details of the proposed facility

Technical details of the proposed facility	
Component	**Description/Dimensions**
Technology	Solar Photovoltaic
Capacity of the facility	Maximum Export Capacity (@ the point of connection): up to **240 MW** Installed power capacity - DC side (PV modules): up to 375.0 MWp Installed power capacity - AC side (inverters): up to 300.0 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 **508 ha**. Surface area (within the project footprint) covered by PV modules, internal roads, MV stations, HV substation and BESS is up to 254 ha (cover ratio up to 0.5)
Area occupied by both permanent and construction laydown areas	Project footprint / fenced area is up to **508 ha**. Surface area (within the project footprint) covered by PV modules, internal roads, MV stations, HV substation and BESS is up to 254 ha (cover ratio up to 0.5) The construction camp (temporary) will be up to 20 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 100 medium voltage stations of 3.0 MW each throughout the proposed development. PV technology is in constant and rapid evolution, and the final choice of type (*e.g.* central inverters or string inverters) and model of inverter can be taken at commission, on the basis of the availability of inverters of the worldwide market and of the cost-efficiency curve. In any case, the total installed capacity of inverters (AC side) will be up to 300 MWac.
Area occupied by inverter/transformer stations/substations	There will be 100 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 3000 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	On-site 22kV/33kV/132kV step-up substation and 132kV switching station will host two 250 MVA 22kV/33kV/132kV transformers (one as spare). On-site substation and switching station occupy a footprint of ±11,250 m^2. This area includes the control buildings.

Areas occupied by buildings	Medium-voltage stations occupy a footprint of to 3,000 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. **15,150 m² (1.5 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 **20 ha** in size.
Number of 132kV powerlines	1 (one) overhead 132kV powerline (double circuit) (the "**Corona 132 kV Powerline**") approximately **7.0 km long**, connecting the on-site HV substation and switching station of the Solar Park to a new 132kV/400kV substation and 400kV switching station (the "Florida 132kV/400kV Substation"). The Corona 132 kV Powerline forms part of this EIA process, while the Florida 132kV/400kV Substation will form part of the EIA process of the Florida Solar Park, proposed by Piscis Energy (Pty) Ltd (Reg. No. 2022/847640/07).
Voltage of overhead power line	132 kV
Servitude of overhead powerline	36 m (18 m from each side of the center line)
Height of the overhead powerline	up to 25 m above the ground level
Type of structures of powerline	Steel monopole (double circuit)
Battery Energy Storage System (BESS)	Battery Energy Storage System (BESS) of **240 MW / 1440 MWh** (6 hour storage), with a footprint up to **20 ha** within the Project footprint / fenced area
Access road	Access to the Corona Solar Park will be from the south-western corner, from a new access road from the Regional Road R73 that runs from the N1, North-East of Winburg, in the direction of Virginia. This access road will be 0.46 km long and will cross the project site (Farms BIDDULPH 329 and TEVREDE 361, Ventersburg RD).
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

Evaluation of the Corona Solar PV facility

The following chapters of the Final EIA Report together with the specialist studies contained within Annexures E – R provide a detailed assessment of the possible impacts that the proposed Corona Solar PV facility may have on the environment. This chapter contains the environmental assessment of the solar PV facility 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, the knowledge gained by the environmental specialists and the EAP and presents a combined and informed opinion of the environmental impacts associated with the proposed development.

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

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

- Impacts on Ecology;
- Impacts on 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 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 pre-screening site visit was 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 riparian floodplains and 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. 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.

An important aspect relating to the proposed development site should be to protect and manage the biodiversity (structure and species composition) of the vegetation types which are represented on the proposed development site. Vegetation removal should be kept to a minimum during the construction phase of the development and only vegetation on the footprint areas should be removed. Mitigation measures and monitoring should however be implemented should the development be approved.

Impacts on Aquatic Ecology

Since the site survey confirmed that no natural freshwater ecosystems are located within the study or investigation area, and the proposed PV plant poses no significant quantum of risk to any freshwater ecosystems in the area, the study area has been assessed to have a low aquatic biodiversity sensitivity. Accordingly, an Aquatic Biodiversity Compliance Statement has been compiled.

Due to the closest freshwater ecosystem being at a distance of greater than 500 m from the study area, no Zones of Regulation will apply to the study area and proposed PV plant, nor would the property be subject to a Water Use Authorisation in terms of Section 21 (c) and (i) of the National Water Act, 1998 (Act No 36 of 1998). The proposed PV Power Plant poses no significant quantum of risk to existing freshwater ecosystems in the area and therefore no risk assessment is required in accordance with GN509 of 2016.

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 were still 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, Lanner Falcon and Secretarybird. Some high-risk avifauna species were recorded from the project area and surrounding, including raptors and water birds.

Based on 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.

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.

Visual Impacts

A preliminary Visual Impact Assessment (Annexure K) and methodology for visual impact assessment was conducted by Mitha Cilliers, an independent visual Specialist to determine visual impact of the proposed project. The full visual impact assessment will analyse and rate the impact of the proposed project on the visual environment and the sense of place of the receiving landscape. The following sensitivity ratings were applied:

- all **Residential** VSRs (R) were rated with a ***high*** sensitivity,
- all Transport VSRs (T) with a *medium* sensitivity, except for the **N1 national road** has a ***high*** sensitivity and the railway line a *low* sensitivity
- all Business/Occupational / Industrial VSRs (B) were rated as *low*, except for tourist attractions/events locations that were rated ***high*** and the Adamson Vlei Primary School that was rated *medium*,
- Open Space Users/Recreational VSRs (O) included agricultural fields, grazing and all open areas. These were rated *low*. The Sandrivier Convention Memorial Stone historical landmark was rated ***high*** and the nature / game reserve areas as *medium.*

The full visual impact assessment will analyse and rate the impact of the proposed project on the visual environment as well as the sense of place of the receiving landscape.

Socio-economic Impacts

The socio-economic impact of the proposed Corona 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

An Agricultural Potential Impact Assessment on soils potential was conducted. 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 proposed development site 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.

Based on Part 1 of the Regulation of Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the proposed area, earmarked for the development of the Corona 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 nature of the soil makes the potential to cultivate crops under arable conditions 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.

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 this report, the planned development can be supported.

Impacts on Heritage Resources (archaeology and palaeontology)

A potential Historical Period settlement, **CRS-HP01** (Possible Historical Period Remains) (Figure 14) was identified from historical aerial imagery in the Solar Park project area. Here, vegetation changes and ashy spoil might point to human activity on the recent past. However, no building remains or material culture were noted and no notable heritage or historical association could be established for the site. The site occurs within the proposed solar park project area and impact on the site is likely where potential direct impacts to the site should be monitored.

The ruined remains of another Historical Period settlement area, **CRS-HP02** (Historical Period Remains) (Figure 14) consisting out of a number of concrete and brick foundation structures, ash middens and material culture such as glass, metal and plastic were noted on the farm Florida in the project area. The site was probably a compound of worker's houses for the Florida farm. An absolute temporal context for the settlement could not be ascertained but it appears on archive aerial photographs (1950) and historical topographical maps (1947 and 1975).

The site is older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999) but structures and features are poorly preserved and no notable heritage or historical association could be established. The site occurs within the proposed powerline corridor area and impact on the site is likely where potential direct impacts to the site should be monitored.

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 heritage context and sensitivity of the proposed development zones points to a landscape of limited heritage significance on a local level.

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 must be added to the EMPr. 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.

Impacts on Civil Aviation

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

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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
DESTEA	Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs
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
Corona Energy	Corona Energy (Pty) Ltd (Applicant)

1 OBJECTIVE OF THE EIA PROCESS

The EIA process consists of two phases (i.e. Scoping and Impact Assessment) and involves the identification and assessment of potential environmental impacts through the undertaking of independent specialist studies, as well as public participation. The processes followed in these two phases is as follows:

The Scoping **Phase** includes the identification of potential issues associated with the project through a desktop study (considering existing information), limited field work, and consultation with interested and affected parties and key stakeholders. This phase considers the broader project site in order to identify and delineate any environmental fatal flaws, no-go and / or sensitive areas. Following a public review period of the Scoping Report, this phase culminates in the submission of a final Scoping Report and Plan of Study for the EIA to the competent authority for consideration and acceptance.

According to Regulation No R 982 of 8 December 2014 (as amended), of the EIA Regulations, 2014, the objective of the EIA process is to, through a process of consultation:

a. Identify the policies and legislation relevant to the study and how the study complies with the policies and legislation.
b. Motivate the need and desirability of the proposed activity including the need and desirability of the activity in the context of the preferred location
c. Identify the location of the development footprint within the preferred site, based on an impact assessment and risk ranking process which includes cumulative impacts and a ranking process of all the identified alternatives focussing on the geographical, physical, biological, social, economic and cultural aspects of the environment.
d. Determine the
    a. Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform preferred alternatives; and
    b. Degree to which these impacts
        i. Can be reversed;
        ii. May cause irreplaceable loss of resources, and
        iii. can be avoided, managed or mitigated.

e. Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment
f. Identify, assess and rank the impacts the activity will impose on th preferred location through the life of the activity;
g. Identify suitable measures to avoid, manage or mitigate identified impacts and
h. Identify risks that need to be managed and monitored.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name of EAP: AGES – Anton von Well
Contact details of EAP:

Physical Address: 120 Marshall Street,
Polokwane, 0699
Telephone number: 015 291 1577
Fax number: 015 291 1577

Expertise of EAP: A National Higher Diploma in Nature Conservation. 23 years of experience in with the management and conducting of EIA's. Registered EAP at EAPASA. Curriculum Vitae of EAP is included in Annexure T.

3 LOCATION OF ACTIVITY

3.1 SURVEYOR GENERAL 21 DIGIT CODES OF DEVELOPMENT AREA

Site location - Surveyor-general 21-digit site code:

F	0	3	5	0	0	0	0	0	0	0	0	0	0	3	2	9	0	0	0	0	0
F	0	3	5	0	0	0	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0
F	0	3	5	0	0	0	0	0	0	0	0	0	0	3	6	1	0	0	0	0	0
1		2				3						4					5				

3.2 PHYSICAL ADDRESS AND FARM NAME

CORONA ENERGY (PTY) LTD is applying for Environmental Authorisation for the establishment of a **renewable energy generation facility (Photovoltaic Power Plant)** with associated infrastructure and structures on the following properties:
Farm Tevrede 361, Ventersburg RD; Farm Biddulph 329, Ventersburg RD and Farm De Dam 27, Ventersburg RD.

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

- Farm De Dam 27, Ventersburg RD (the project site);
- Farm Biddulph 329, Ventersburg RD (the project site);
- Remainder of the Farm Le Roux 766, Ventersburg RD;
- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD;

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

Preliminary Powerline Alignment - Surveyor-general 21-digit site code:

F	0	3	5	0	0	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0
F	0	3	5	0	0	0	0	0	0	0	0	0	3	2	9	0	0	0	0	0
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	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 project site is located ±12 km southeast of Virginia town and ±22 km South-West of Ventersburg.

The renewable energy generation facility will be a **Photovoltaic (PV) Power Plant** with a **maximum generation capacity up to 240 MW** at the point of connection (Maximum **Export Capacity**).

The name of the facility will be **CORONA SOLAR PV FACILITY.**
The **footprint (fenced area)** of the proposed development is approximately **508 ha in extent**.

Access to the Corona Solar PV facility will be from the south-western corner, from a new access road from the Regional Road R73 that runs from the N1, North-East of Winburg, in the direction of Virginia. This access road will be 0.46 km long and will cross the project site (Farms BIDDULPH 329 and TEVREDE 361, Ventersburg RD).

Corona Energy (Pty) Ltd intends to participate with the Corona Solar PV facility in the **Renewable Energy Independent Power Producer Procurement Programme (REIPPPP),** (Round 7) launched by the **Department of Mineral Resources and Energy ("DMRE").**

4 REQUIREMENT FOR AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In order to develop the facility, **Corona Energy (Pty) Ltd** must undertake an Environmental Impact Assessment (EIA) process and acquire environmental authorisation from the *National Department of Forestry, Fisheries and the Environment (DFFE)*, in consultation with the *Free State Department of Economic Development, Environment, Conservation and Tourism (DESTEA)*, in terms of the EIA Regulations, 2014 published on 8 December 2014 (as amended) under section 24(5) and 44 of the National Environmental Management Act, 1998 (NEMA, Act No. 107 of 1998).

Corona Energy (Pty) Ltd is the applicant for the Corona 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 7.0 km long** (the "**Corona 132 kV Powerline**").

The **Florida 132kV/400kV Substation** is planned to be located on Portion 1 of the Farm Florida 633 and will be connected to the Eskom Theseus Main Transmission Substation (MTS) through a new 400 kV powerline 6.0 km long (the "**Florida 400 kV Powerline**").

The Corona 132 kV Powerline forms part of this EIA process, while the Florida 132kV/400kV Substation and the Florida 400 kV Powerline will form part of the EIA process of the Florida Solar Park, proposed by **Piscis Energy (Pty) Ltd (Reg. No. 2022/847640/07).**

This Florida 132kV/400kV Substation and the Florida 400 kV Powerline will be shared by several projects (*i.e.* the Virginia 4, 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 12 km North-West of the north-western corner of project site.

4.1 LEGAL REQUIREMENTS AS PER THE EIA REGULATIONS, 2014 (AS AMENDED) FOR THE UNDERTAKING OF AN IMPACT ASSESSMENT REPORT

The independent Environmental Assessment Practitioners (EAP's) which have been appointed for the undertaking of the detailed environmental studies in compliance with the 2014 EIA Regulations (as amended), is **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 Corona Energy (Pty) Ltd 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 authorisation of the project.

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

5 PLAN OF THE PROPOSED ACTIVITY

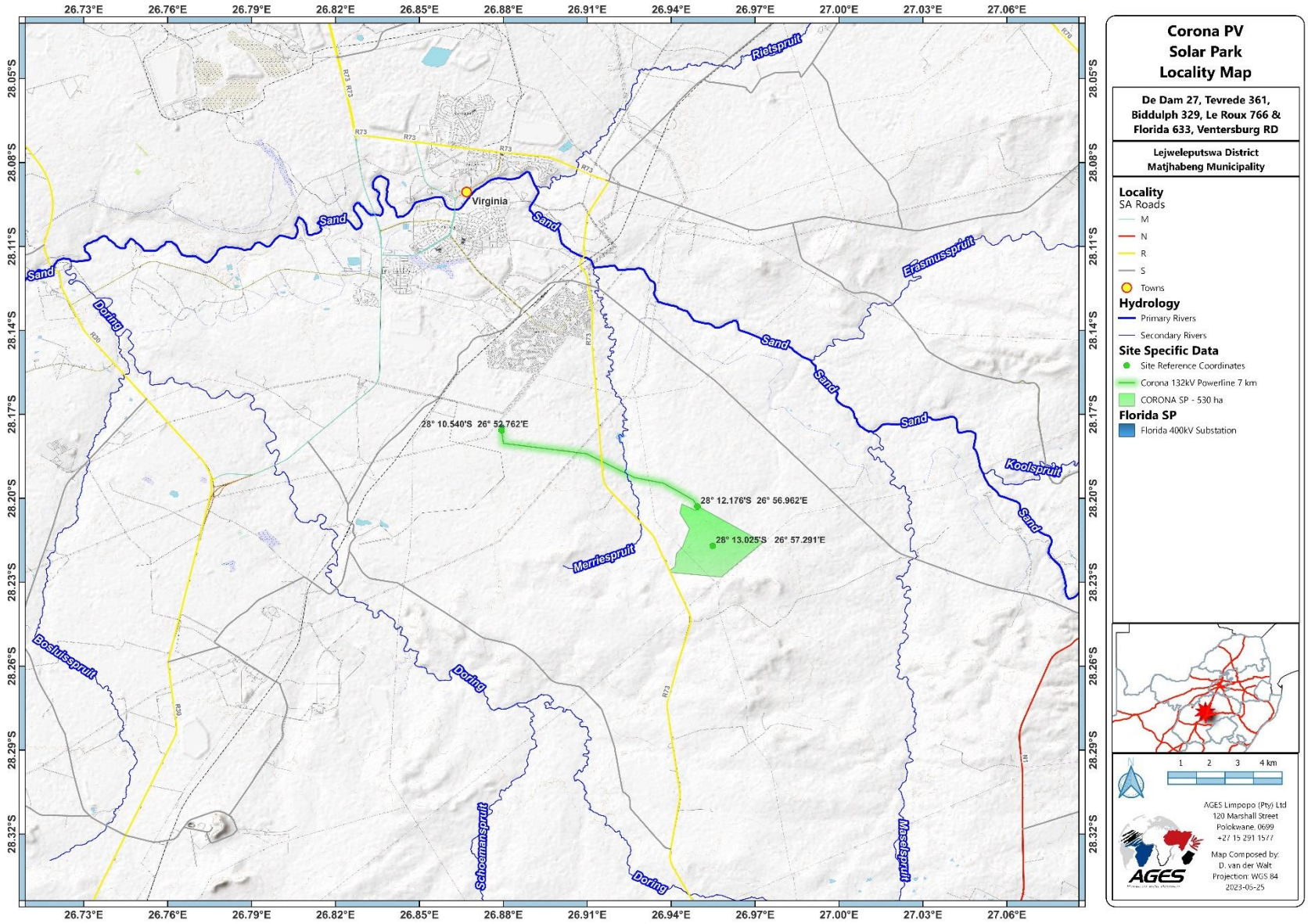

Figure 1 Regional Location Map of the project area

6 SCOPE OF THE PROPOSED ACTIVITY

6.1 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),** involved in the proposed development, are detailed in table below.

Table 2. Listed Activities in terms of EIA Regulations 2014 (As amended) triggered by the proposed development

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.**	The connection of the Corona Solar Park to the Eskom grid will be done according to the Eskom connection solution which may require: • One on-site high-voltage substation with high-voltage power transformers, stepping up the voltage from 22 kV (or 33 kV) to 132 kV, and one 132 kV busbar with metering and protection devices. The on-site high-voltage substation will be equipped with control buildings and one 132 kV busbar with metering and protection devices ("switching station"). • One 132kV powerline (double circuit), approximately 7.0 km long, for the connection of the on-site substation to the 132kV busbar of the new Florida 132kV/400kV Substation, planned to be located on Portion 1 of the Farm Florida 633. The connection infrastructure is located outside urban areas or industrial complexes.
GN R.327, Item 12 (ii)(c) **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**	The proposed Corona 132kV Powerline, 7.0 km long, , as well as the proposed access road from the regional road R73, 0.46 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 may be constructed within 32m from these features, entailing the removal of vegetation from an area bigger than 100 m^2.
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**	The proposed Corona 132kV Powerline, 7.0 km long, , as well as the proposed access road from the regional road R73, 0.46 km long will cross wetlands and drainage channels that have been identified as per the delineation of the appointed wetland specialist. The interception of these wetlands and drainage channels will entail, during the construction phase, the movement of soil for a volume of more than 10 m^3.
GN R.327, Item 24 (ii) **The development of a road-** **(ii) with a reserve wider than 13,5m, or where no reserve exists where the road is wider than 8m**	Access to the Corona Solar Park will be from the regional road R73 between Virginia and the N1. During construction phase, the access road and some of the internal roads will have a reserve wider than 13.5 m to allow the transportation of abnormal goods (e.g., power transformers, etc.).

GN R.327, Item 28 (ii) **Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:** **(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 ha**	The Corona 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 508 ha). The project site is currently being used for livestock grazing and agriculture.
GN R.325 Item 1 **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** **(a) within an urban area.** **(b) On existing infrastructure**	The proposed Corona Solar PV facility consists of the construction, operation and maintenance of a Photovoltaic (PV) Power Plant with a maximum generation and storage capacity up to 240 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 the Farms Tevrede 361 Ventersburg RD, Biddulph 329 Ventersburg RD and De Dam 27 Ventersburg RD.
GN R.325 Item 15 **The clearance of an area of 20 ha or more of indigenous vegetation**	The construction of the Corona Solar PV facility will require clearance of indigenous vegetation, where the total area to be transformed (footprint of the plant) will be up to 508 ha.
GN R.324, Item 12 (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.**	The Corona Solar Park and the Corona 132kV powerline will affect an area of 300 square metres or more of indigenous vegetation, as endangered ecosystem (Vaal-Vet Sandy Grasslands) in terms of section 52 of the NEMBA and Critical Biodiversity areas identified in the Free State Biodiversity Conservation Plan. The footprint of the Corona Solar Park and the Corona 132kV Powerline will be developed within 100m from the edge of wetlands.

6.2 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 240 MW.

The construction timeframe is estimated to be 24 months.

The preferred technical solutions envisage:

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

Therefore, the Corona Solar Park will generate:

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

The Global Horizontal Irradiation (GHI) of the site is 2,099 kWh/m^2/year (source: https://solargis.info/imaps/).

The energy generated by the Corona Solar PV will reduce the quantity of pollutants and greenhouse gases emitted into the atmosphere. The reduced amount of CO_2 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 Corona Solar PV. The quantity of the avoided CO_2 is calculated as follows: the energy produced by the Corona Solar Park (up to 787.5 GWh/y or 918.7 GWh/y) is multiplied by the Eskom's average emission factor which is 1.015 t CO_2/MWh (source: Energy Research Centre, University of Cape Town. (2009 Carbon accounting for South Africa).

This means that, in the case of Corona Solar Park, the avoided CO_2 emissions are approximately 775,862 tons of CO_2 per year in the case of PV modules mounted on fixed mounting systems, or 905,172 tons of CO_2 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 Corona Solar Park will be approximately 212,838 tons of coal/year in the case of PV modules mounted on fixed mounting systems, or 248,311 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 is given in the following paragraphs.

6.3 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 had been defined in consideration of the results of some specialist studies conducted during this scoping phase. The PV plant is designed and conceived in order to minimize visual and noise impacts, as well as to operate safely and assuring a high level of reliability, with low water consumption and the need only for easy and quick maintenance and repair for approximately 35 to 40 years.

The footprint (fenced area) of the Corona Solar PV Facility will be up to 508 ha.

The main drives of the proposed layout are:

- to maximize the energy production and the 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 on 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, as much as possible, the Critical Biodiversity Areas (CBAs).

The proposed layout plan (attached as Annexure B and also shown in figure below) was drawn using PV modules mounted on trackers. In the case of PV modules mounted on fixed mounting systems, the layout plans will not change, except for the orientation of the PV arrays: East-West instead of North-South. The site layout plan included in Annexure B is more detailed.

The required footprint - corresponding on the fenced area - will be up to 508 ha, and the maximum height of the structures (PV modules and support frames) will be approximately 4.5m above the ground level.

The location of the planned footprint will be further assessed (and amended - if required) in the Environmental Impact Assessment Reports. All inputs and comments arising from the Public Participation Process were considered as well as inputs from specialist and specialist reports.

Table 3. Geographical coordinates of the Corona SP footprint

Corona Solar Park Development Area (footprint)		
Point	**Longitude**	**Latitude**
P01	26° 56' 28.88" E	28° 11' 46.75" S
P02	26° 56' 21.88" E	28° 11' 59.63" S
P03	26° 56' 27.64" E	28° 12' 04.70" S
P04	26° 56' 29.94" E	28° 12' 10.19" S
P05	26° 56' 40.25" E	28° 12' 29.30" S
P06	26° 56' 47.68" E	28° 12' 39.69" S
P07	26° 56' 52.26" E	28° 12' 46.22" S
P08	26° 56' 53.99" E	28° 12' 52.58" S
P09	26° 56' 53.19" E	28° 12' 54.32" S
P10	26° 56' 49.87" E	28° 12' 54.74" S
P11	26° 56' 47.46" E	28° 12' 52.91" S
P12	26° 56' 43.18" E	28° 12' 47.88" S
P13	26° 56' 39.02" E	28° 12' 58.33" S
P14	26° 56' 43.50" E	28° 13' 02.46" S
P15	26° 56' 44.06" E	28° 13' 03.58" S
P16	26° 56' 44.85" E	28° 13' 04.62" S
P17	26° 56' 46.38" E	28° 13' 05.85" S
P18	26° 56' 47.79" E	28° 13' 07.91" S
P19	26° 56' 49.18" E	28° 13' 09.22" S
P20	26° 56' 53.20" E	28° 13' 10.00" S
P21	26° 56' 55.60" E	28° 13' 11.23" S
P22	26° 56' 59.52" E	28° 13' 12.25" S
P23	26° 57' 03.32" E	28° 13' 15.11" S
P24	26° 57' 06.77" E	28° 13' 18.69" S
P25	26° 57' 07.54" E	28° 13' 20.78" S
P26	26° 57' 07.54" E	28° 13' 23.99" S
P27	26° 57' 08.87" E	28° 13' 25.78" S
P28	26° 57' 10.73" E	28° 13' 28.63" S

P29	26° 57' 11.15" E	28° 13' 30.88" S
P30	26° 57' 03.28" E	28° 13' 31.36" S
P31	26° 56' 34.35" E	28° 13' 02.14" S
P32	26° 56' 32.38" E	28° 13' 06.14" S
P33	26° 56' 27.26" E	28° 13' 11.13" S
P34	26° 56' 30.11" E	28° 13' 17.45" S
P35	26° 56' 32.23" E	28° 13' 18.08" S
P36	26° 56' 34.62" E	28° 13' 22.58" S
P37	26° 56' 35.14" E	28° 13' 24.06" S
P38	26° 56' 37.06" E	28° 13' 27.03" S
P39	26° 56' 40.98" E	28° 13' 31.74" S
P40	26° 56' 43.61" E	28° 13' 34.26" S
P41	26° 56' 44.96" E	28° 13' 35.26" S
P42	26° 56' 47.21" E	28° 13' 37.62" S
P43	26° 57' 28.36" E	28° 13' 41.28" S
P44	26° 57' 44.04" E	28° 13' 27.92" S
P45	26° 57' 42.06" E	28° 13' 26.14" S
P46	26° 57' 45.22" E	28° 13' 15.57" S
P47	26° 58' 00.26" E	28° 13' 00.35" S
P48	26° 58' 04.92" E	28° 12' 39.98" S
P49	26° 57' 41.98" E	28° 12' 27.27" S
P50	26° 57' 38.80" E	28° 12' 30.49" S
P51	26° 57' 37.69" E	28° 12' 33.21" S
P52	26° 57' 34.72" E	28° 12' 36.44" S
P53	26° 57' 30.56" E	28° 12' 42.87" S
P54	26° 57' 29.23" E	28° 12' 42.36" S
P55	26° 57' 28.22" E	28° 12' 42.23" S
P56	26° 57' 21.76" E	28° 12' 38.58" S
P57	26° 57' 28.63" E	28° 12' 30.82" S
P58	26° 57' 29.84" E	28° 12' 28.60" S
P59	26° 57' 33.48" E	28° 12' 23.86" S
P60	26° 57' 31.34" E	28° 12' 21.91" S
P61	26° 57' 31.38" E	28° 12' 21.39" S
P62	26° 57' 21.68" E	28° 12' 16.02" S
P63	26° 57' 20.91" E	28° 12' 16.60" S
P64	26° 57' 17.05" E	28° 12' 16.60" S
P65	26° 57' 14.37" E	28° 12' 16.25" S
P66	26° 57' 12.92" E	28° 12' 15.09" S
P67	26° 57' 13.88" E	28° 12' 11.69" S
Overall footprint: 508 ha		

The project layout and the other plant components are detailed in the following drawings attached as Annexure B:

Table 4. List of maps and drawings included as Annexure B

#	Code	Title
01	CRNSP_00_LM1_r2	Locality Map (2 maps)
02	CRNSP_00_LM2_r1	Development Area and Sensitivity Map
03	CRNSP_00_LM3_r1	Powerline Alignment and Sensitivity Map (2 maps)
04	CRNSP_00_LM4_r0	Cumulative Map
05	CRNSP_00_LM5_r0	Development Area and CBAs Map
06	CRNSP_01_r1	Layout plan – PV power plant up to 240 MW
07	CRNSP_02_r0	Mounting System, Option 1 (fixed)
08	CRNSP_03_r0	Mounting System, Option 2 (Trackers)
09	CRNSP_04_r0	Medium-Voltage Stations
10	CRNSP_05_r0	Control Building and MV receiving station
11	CRNSP_06_r0	On-site substation and switching station
12	CRNSP_07_r0	132 kV Steel monopole structure
13	CRNSP_08_r0	Warehouse (2 drawings)
14	CRNSP_09_r0	Florida 400kV substation (*)
15	CRNSP_10_r0	400kV Tower – Eskom Specs (*)

(*) The **Florida 132kV/400kV Substation** and the **Florida 400 kV Powerline** will form part of the EIA process of the **Florida Solar Park**, proposed by **Piscis Energy (Pty) Ltd (Reg. No. 2022/847640/07)**.

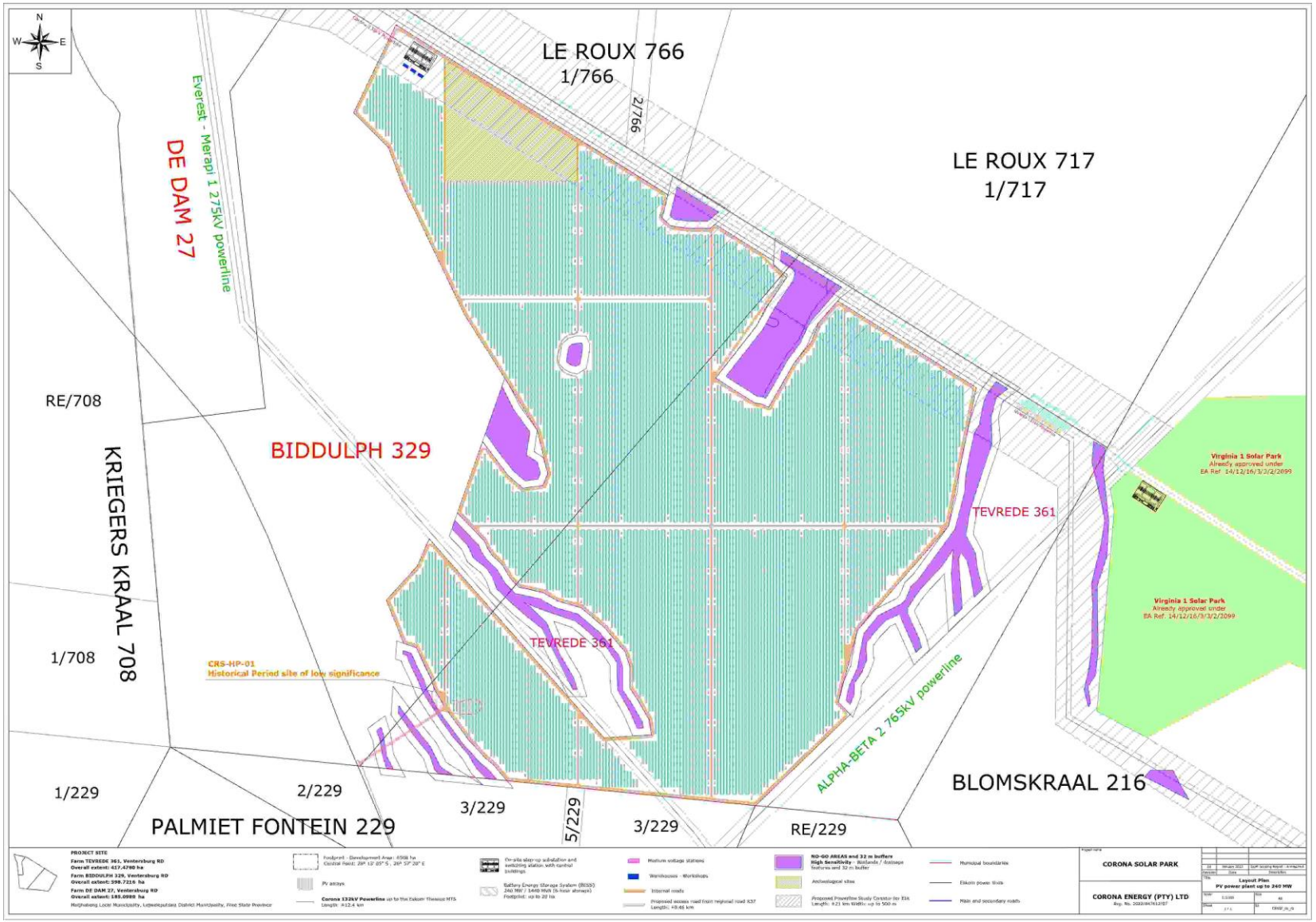

Figure 2. Proposed Layout Plan of the Corona Solar PV facility

6.4 PRIMARY COMPONENTS

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

- Photovoltaic modules (mono-crystalline, poly-crystalline, mono 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)
- A **new 132 kV power line (double circuit),** approximately **7.0 km long** for the connection of the on-site substation to the new Florida 132kV/400kV Substation, planned to be located on Portion 1 of the Farm Florida 633, Ventersburg RD (this 132kV/400kV substation is not part of the current EIA process)
- **Battery Energy Storage Systems (BESS),** with a Maximum Export Capacity up to 240 MW and up to 6-hour storage capacity of 1 440 MWh), with a footprint of 20 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
- Access road 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.

6.4.1 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 in order to create electrical energy.

The preferred technical solutions are:

- Mono / bi-facial mono / polycrystalline modules, mounted on:
- mounted on horizontal 1-axis trackers,

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

The PV technology is in constant and rapid evolution, this means that 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, on the basis of the availability of PV modules and mounting systems, of the worldwide market and of the cost-efficiency curve.

The required footprint - corresponding to the fenced area - will not exceed 508 ha, and the maximum height of structures (PV modules and support frames) will be approximately 4.5 m above ground level. PV modules will be assembled on zinced steel or aluminium frames, to form PV arrays. The metal frames that sustain PV arrays are set to the ground by fixed support poles.

Table 5. Geographical coordinates of the Corona SP PV panels within the project footprint

Corona Solar Park PV panels		
Point	Longitude	Latitude
P01	26° 56' 28.88" E	28° 11' 46.75" S
P02	26° 56' 21.88" E	28° 11' 59.63" S
P03	26° 56' 27.64" E	28° 12' 04.70" S
P04	26° 56' 29.94" E	28° 12' 10.19" S
P05	26° 56' 40.25" E	28° 12' 29.30" S
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P11	26° 56' 47.46" E	28° 12' 52.91" S
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P14	26° 56' 43.50" E	28° 13' 02.46" S
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P64	26° 57' 17.05" E	28° 12' 16.60" S
P65	26° 57' 14.37" E	28° 12' 16.25" S
P66	26° 57' 12.92" E	28° 12' 15.09" S
P67	26° 57' 13.88" E	28° 12' 11.69" S
Overall footprint: 508 ha		

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.

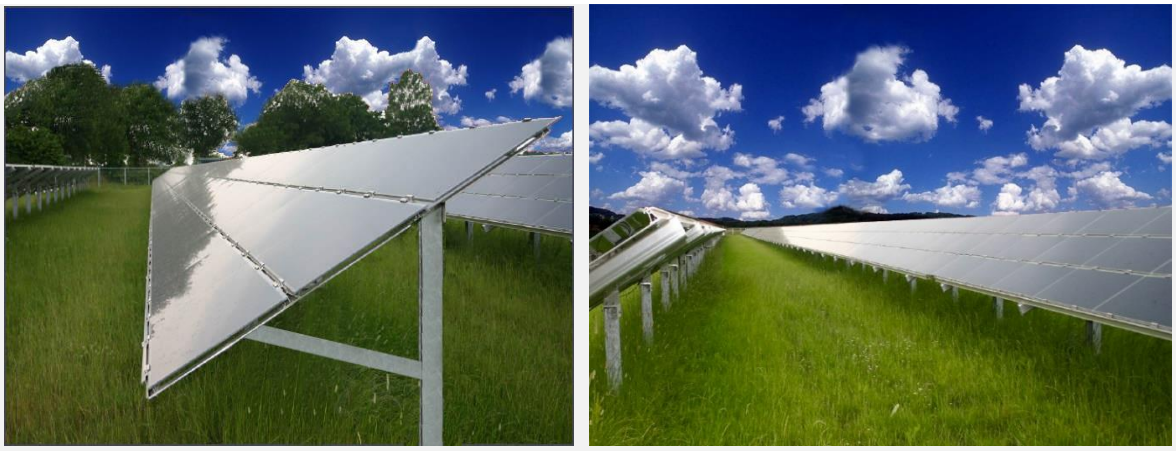

Figure 3. Lateral views of PV arrays mounted on fixed mounting systems

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 drawing included in Annexure B:

- CRNSP_02_r0 *Mounting System – Alternative option 1: fixed mounting systems*

B) 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 by several PV arrays North-South oriented and linked by a horizontal axis, driven by a motor. The horizontal axis allows the rotation of the PV arrays toward the West and East direction, in order to follow the daily sun path.

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

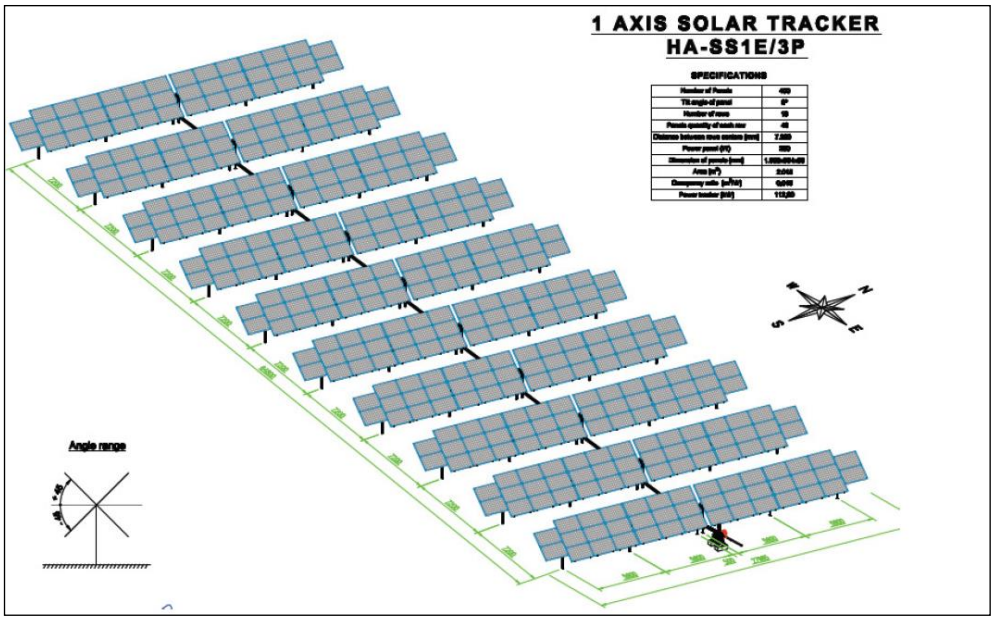

Figure 5 . Simulation views of the PV arrays mounted on 1-axis horizontal tracker

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

For further details, see also the drawing of the Annexure B:

- CRNSP_03_r0 *Mounting System – Alternative option 2: horizontal single-axis trackers*

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 in order to be connected to DC-connection boxes. Each String Box allows the parallel connection of several PV strings (also 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 in order 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, or to "string inverters", located next to trackers. Each station comprises prefabricate buildings designed to host DC/AC inverters (in case of central 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 (600 V); subsequently the AC will pass through a medium-voltage transformer in order to increase the voltage up to 22 kV (or 33 kV).

The medium-voltage stations are detailed in the drawing of the Annexure B:

- CRNSP_04_r0 *Medium-voltage stations*

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 one high-voltage power transformer of 300 MVA (plus one as spare), which will step up the electric energy from the medium voltage level (22 kV or 33 kV) to the required connecting voltage (i.e.132 kV). The power transformers will be connected to an on-site 132 kV busbar (the so called "switching station"), to be equipped with protection and metering devices.

The new on-site HV substation will need to be equipped with circuit breakers upstream and downstream, to disconnect the PV power plant and/or the 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 B:

- CRNSP_05_r0 *Control building and medium-voltage receiving station*
- CRNSP_06_r0 On-site *high-voltage substation and switching station*

The power generation capacity at the delivery point (Maximum Export Capacity) will be up to 240 MW.

Table 6. Geographical coordinates of the Corona on-site substation and 132 kV switching station

Corona on-site substation and switching station (within the development area / footprint)		
Point	**Longitude**	**Latitude**
P1	26° 56' 31.84" E	28° 11' 49.15" S
P2	26° 56' 30.14" E	28° 11' 51.56" S
P3	26° 56' 34.04" E	28° 11' 53.73" S
P4	26° 56' 35.75" E	28° 11' 51.32" S
Substation footprint: ±1.1 ha		

6.4.1.1 Corona 132 kV Powerline

The Corona Solar Park will be connected to a new 132kV/400kV substation and 400kV switching station (the "**Florida 132kV/400kV Substation**"), through a **new 132 kV powerline 7.0 km long** (the "**Corona 132 kV Powerline**").

The new 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 powerline will last approximately **9 months** and will involve a **team of 10 to 15 people**. Monopole structures installation will not require the establishment of a permanent construction site, but will be done step-by-step, to only affect small stretches of corridor and for a short time.

An **access road (dirty road)**, approximately 4.0 m wide, may be constructed within the power line servitude, for construction and maintenance activities. In correspondence of the turning points, the road reserve will be up to 14 m in order to allow the transportation of abnormal loads (steel monopoles).

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

The proposed 132 kV powerline (double circuit) may be built by Corona Energy (Pty) Ltd and/or Eskom but will be owned and operated by Eskom Distribution. This will depend on the Eskom grid code in relation to the IPP's (Independent Power Producers) and on a Connection Agreement to be finalized prior to or simultaneously with the conclusion of the PPA (Power Purchase Agreement) in respect of the options of retaining ownership of the connection works once completed.

The connecting power line, according to the proposed powerline alignment, will cross the following properties, within the "Powerline Study Corridor":

- Farm De Dam 27, Ventersburg RD;
- Farm Biddulph 329, Ventersburg RD;
- Remainder of the Farm Le Roux 766, Ventersburg RD;
- Portions 1 and 4 of the Farm Florida 633, Ventersburg RD;

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

Please see below a table with the geographical coordinates of the proposed powerline alignment:

Table 7. Corona 132kV Powerline: Geographical coordinates of the proposed alignment

Corona 132kV powerline		
Point	**Longitude**	**Latitude**
P1 on-site substation	26° 56' 31.30" E	28° 11' 50.19" S
P2 turning point	26° 56' 13.95" E	28° 11' 40.57" S
P3 turning point	26° 55' 37.05" E	28° 11' 33.45" S
P4 turning point	26° 54' 34.81" E	28° 11' 02.62" S
P5 turning point	26° 52' 48.19" E	28° 10' 49.30" S
P6 turning point	26° 52' 46.28" E	28° 10' 34.84" S
P7 turning point	26° 52' 46.56" E	28° 10' 33.51" S
P8 Florida 132kV/400kV substation	26° 52' 46.28" E	28° 10' 32.02" S
Overall length		**7.0 km**

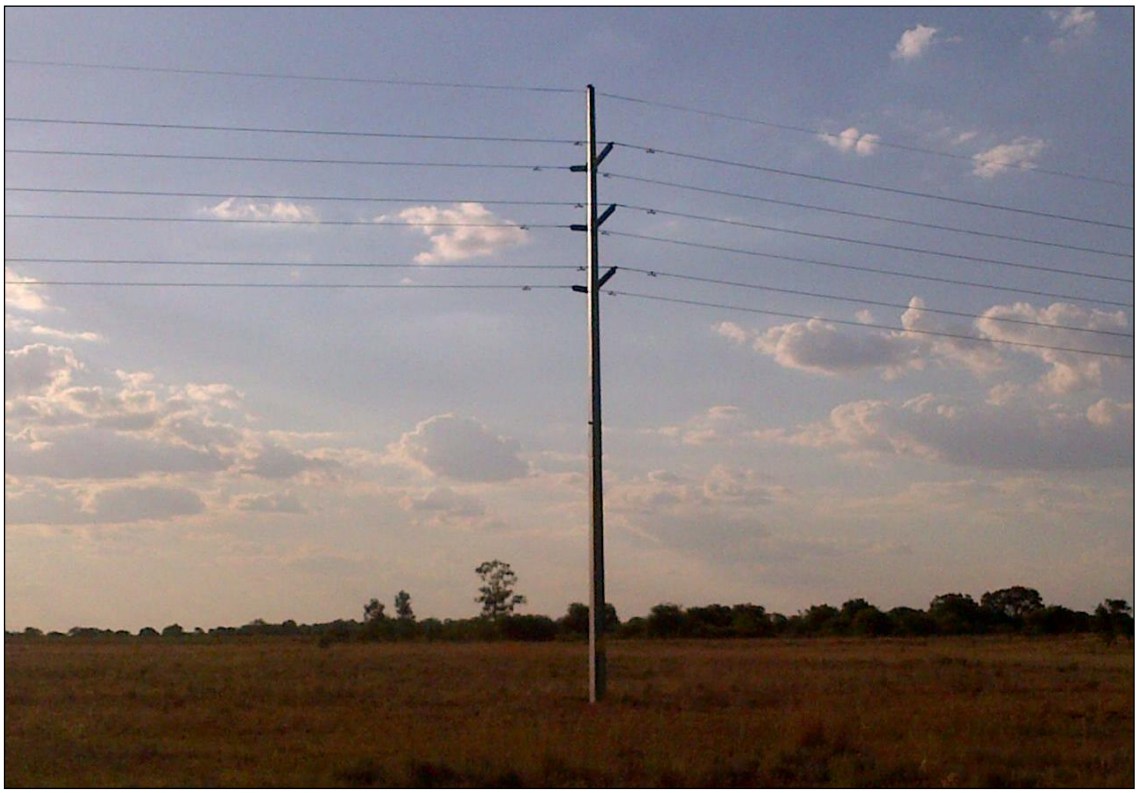

Figure 7. Steel monopole structure for a 132 kV powerline (double circuit)

6.4.1.2 Battery Energy Storage System (BESS)

A Battery Energy Storage System (BEES) with an output capacity up to **240 MW** and a storage capacity up to **1440 MWh (6-hour storage)** will be installed next to the on-site step-up substation and switching station, within the footprint and fenced area of the Corona Solar Park.

The lithium-ion batteries will store energy at times of low energy demand and release the energy to the grid at times of pick 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 20 hectares** and will comprise of the following equipment:

- Up to 288 containers (each up to 40 m^2), each with a storage capacity of up to 5 MWh and on a concrete platform. These will house the batteries, management system and auxiliaries.
- Up to 144 transformer stations (up to 35 m^2 each).
- Up to an additional 10 m^2 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;
- Temporary infrastructure including a site camp and a laydown area.

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

Table 8. Geographical coordinates of the Corona SP BESS

Corona Battery Energy Storage System (within the development area / footprint)		
Point	**Longitude**	**Latitude**
P1	26° 56' 37.10" E	28° 11' 52.65" S
P2	26° 56' 37.07" E	28° 12' 09.61" S
P3	26° 56' 58.83" E	28° 12' 09.62" S
P4	26° 56' 58.82" E	28° 12' 06.78" S
P5	26° 56' 58.82" E	28° 12' 04.87" S
P6	26° 56' 58.82" E	28° 12' 03.94" S
P7	26° 56' 51.05" E	28° 11' 59.64" S
P8	26° 56' 37.62" E	28° 11' 52.19" S
BESS footprint: up to 20 ha		

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 commonly connected at AC MV level to the Renewable Power Plant for HV conversion and grid interconnection.

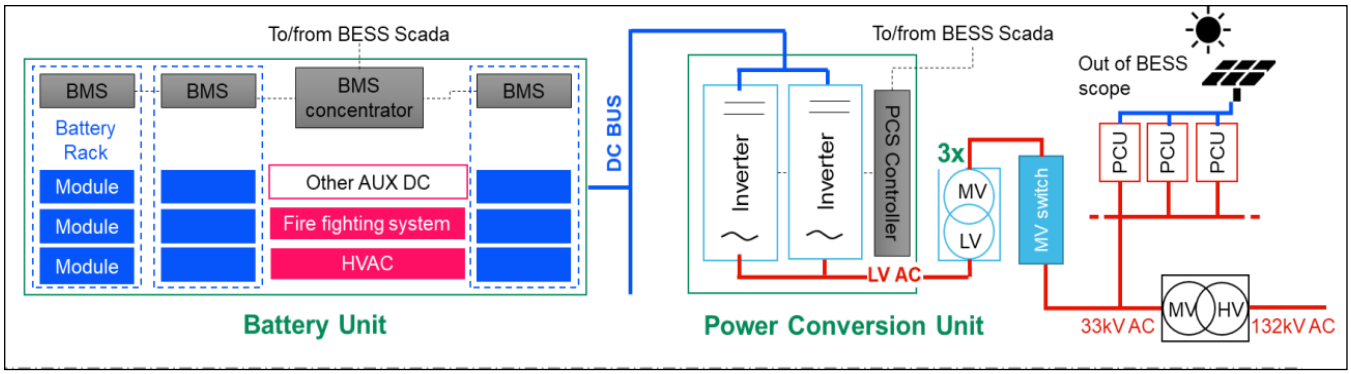

Figure 8. Battery Energy Storage System (BESS)

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.

6.4.2 ACCESS ROAD AND INTERNAL ROADS

Access to the Corona Solar Park will be from the south-western corner, from a **new access road from the Regional Road R73** that runs from the N1, North-East of Winburg, in the direction of Virginia. This access road will be **0.46 km long** and will cross the project site (Farms BIDDULPH 329 and TEVREDE 361, Ventersburg RD).

The geo-graphical coordinates of the access road from the Regional Road R73 are the followings:

Table 9. Geographical coordinates of the proposed access road from R73

Corona Solar Park access road from R73		
Point	**Longitude**	**Latitude**
Access point from R73	26° 56' 22.70" E	28° 13' 35.10" S
Ending point (fence)	26° 56' 37.00" E	28° 13' 26.90" S
Longitude [km]		**0.46**

During construction phase, the access road and 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.).

During operation, access road 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 of 4.0 meters allowing for the slow-moving heavy vehicles.

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.

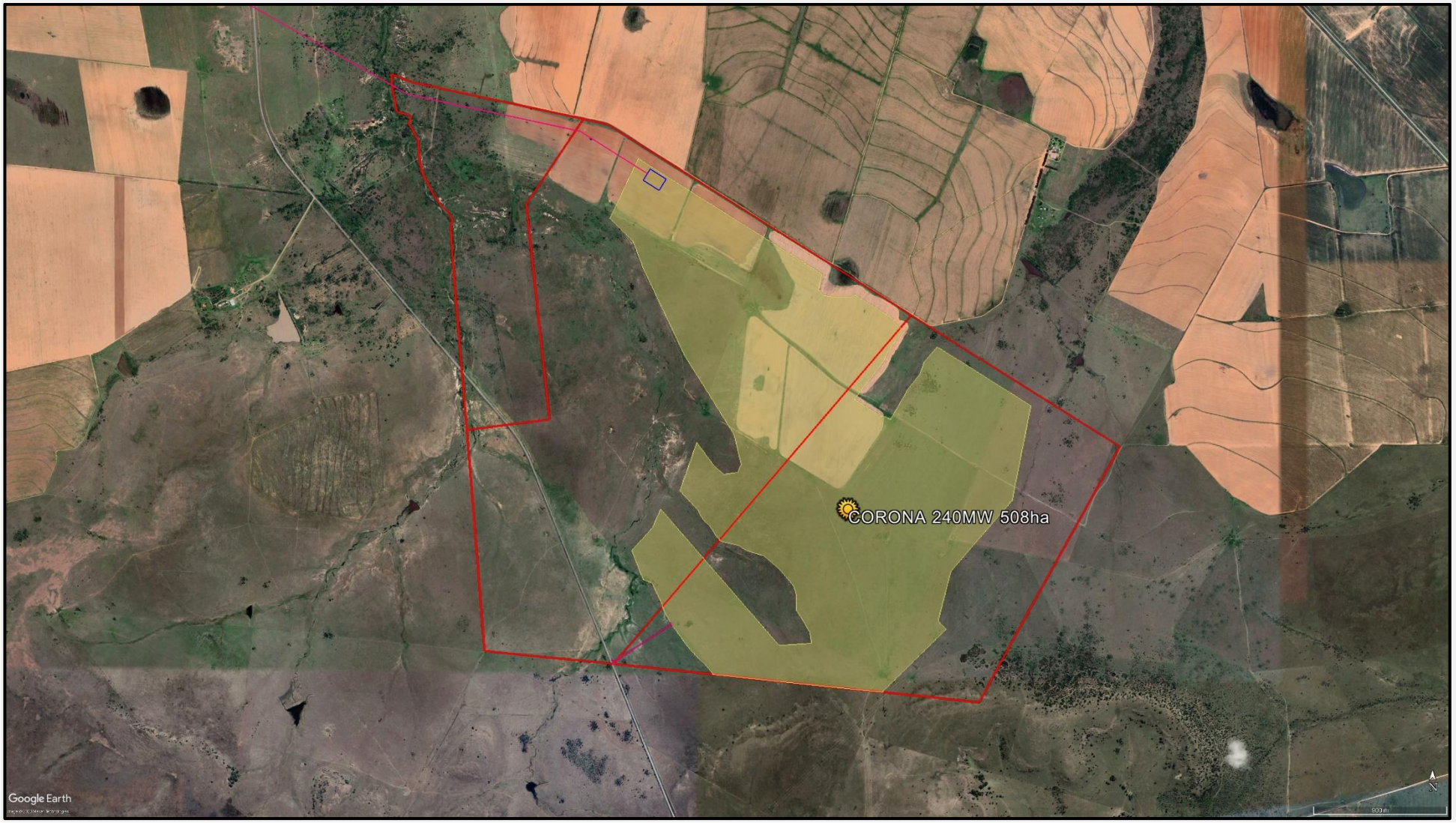

Figure 9. Access road (in purple at bottom) from the regional road R73 to the development area (in yellow)

6.4.3 TRAFFIC IMPACT OF THE PROPOSED DEVELOPMENT

Approximately 150 people are expected to be employed during the construction period (24 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.
Cumulatively should all three solar parks (Florida, Corona & Quagga) be constructed the expected number of vehicle trips to and from the site during peak hour will be 72 during the construction phase.

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 tank (capacity of <30 000 litres) is recommended.

The following recommendations are made from a traffic engineering perspective as part of the proposed development:

- During the construction phase, 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.
- Dedicated 60m left-turn lane on the northern approach of Road R73 recommended to allow safe space for vehicles turning left to reduce speed for turning and allowing through traffic to continue at normal speed.
- 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.
- Approval for the position and geometric layout for the proposed access intersection from and to R73 Road should be obtained from the Free State Department of Police, Roads and Transport as part of the detail design phase.

The same as above is required (**Cumulatively**) if all three Solar parks namely Florida, Corona and Quagga are developed simultaneously.

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6.4.3.1 Traffic impact – operation phase

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

- during the daytime approximately 17 people;
- during the night-time 8 people.

The expected number of vehicle trips to and from the site during peak hour will be eight (8) during the operational phase.

Cumulatively should all three solar parks be constructed the expected number of vehicle trips to and from the site during peak hour will be 24 during the operational phase.

6.4.4 LIGHTING SYSTEM

The lighting system will consist of the following equipment:

- Floodlight-towers: maximum 10 m high, with directional lamps (LED type) of 120 W, installed around the 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).

6.4.5 WATER REQUIREMENTS

Water requirements during the construction phase

The construction phase will last approximately 24 months.

A) Construction of internal gravel roads

- Water is necessary for the construction of internal gravel roads, in order to get the gravel compacted to optimum moisture content (OMC).
- The surface of internal gravel roads will be approximately 180,000 m^2.
- 50 liters of water / m^2 of internal of roads will be required.
- Water consumption for internal roads will be:
    - 180,000 m^2 x 50 l/m^2 = 9,000 m^3.

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 - once being selected as Preferred Bidder by the Department of Mineral Resources and Energy and having finalized the Connection Agreement with Eskom, where in particular it is agreed the envisaged connection timeline - evaluates to build the proposed Solar

Park in a timeframe shorter than 24 months (*i.e.* 528 working days). For example, in the case the construction works are planned to last only 18 months (*i.e.* 396 working days), the average number of workers required on site during construction is 200.

- Each worker needs 50 liters / 8 working hours for sanitary use.
- Water consumption will be:
- 150 people x 50 l/person x 528 working days = 3,960 m^3 over 24 months, or
- 200 people x 50 l/person x 396 working days = 3,960 m^3 over 18 months

C) Concrete production

- Concrete is necessary for the basements of the medium-voltage stations, the high-voltage substation, the control buildings, the warehouses and the basement of the BESS. The overall amount of concrete to be produced will be approximately 30,000 m^3.
- 200 litres of water are needed for 1 cubic meter of concrete.
- Water consumption will be:
  - 30,000 m^3 x 200 l/m^3 = 6,000 m^3.

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 in order to not increase the water requirement during the 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.

Table 10. 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	*months*	24
Timeframe of the construction activities - calendar days	*days*	760
Overall water consumption for internal roads	*m^3*	9,000
Overall water consumption for sanitary use	*m^3*	3,960
Overall water consumption for concrete production	*m^3*	6,000
OVERALL WATER CONSUMPTION	***m3***	**18,960**
Daily water consumption (average over 760 calendar days)	***m3/day***	**26.3**

Storage tanks will be sized in order to provide a reserve of water approximately **200 m^3**.

Water requirements during the operational phase

During operation, water is only required for the operational team on site (sanitary use), as well as limited cleaning of solar panels. Further water consumption may 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 35 - 40 years.

The Corona Solar Park will be in operation 7 days per week; therefore personnel will operate according to shifts. The surveillance team will be present during day-time, night-time and weekends. The average number of people working at the site on the same time 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** per **25 people** (17 people daytime and 8 people at night), The daily water consumption will be approximately 3,750 litres/day **(1,370 m^3 per year).**

B) Water consumption to clean the PV modules

The cleaning activities of the solar panels will be limited to only twice per year. It is assumed that up to 1.0 litre per m^2 of PV panel surface will be needed. Therefore, the amount of water for cleaning is up to 1750 m^3 per cleaning cycle and thus 3500 m^3/year.

PV modules cleaning activity can last less than 1 month. If cleaning activities last approximately 2 weeks (12 working days), the daily water consumption will be approximately **71 000 liters/day**, **over 12 days**.

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 m^3/year**).

The water consumption will increase up to **76 667 liters/day** during the cleaning of the solar modules (72 917 liters/day for cleaning activity and 3 750 for sanitary use), which will last less than a month and will occur twice per year during the dry period. PV modules are conceived as self-cleaning with the 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 11. 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	*l/day*	3 750
Average daily water consumption during cleaning activity (*)	*l/day*	76 667
Average monthly water consumption for sanitary use (over 30 days)	*l/month*	112 500
Annual water consumption for sanitary use	***m^3/year***	**1 370**
Annual water consumption for PV modules cleaning activities (twice/year)	***m^3/year***	**3 500**
ANNUAL WATER CONSUMPTION DURING OPERATION	***m3/year***	**4 870**
DAILY WATER CONSUMPTION DURING OPERATION (average over 365 day)	***m3/day***	**13.34**

(*) over 24 working days, twice per year

Water provision during construction and operation

Water needs for the construction phase (18 960 m^3 over approximately 24 months) and the operational phase (4 870 m^3/year) can be obtained from on-site boreholes. A Water Use License Application will be submitted to DWS.

6.4.6 SEWAGE

Sewer reticulation will be handled by a suitable patented and commercially available wastewater treatment system, which will be a closed 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.

The effluent from the wastewater treatment system will be suitable for irrigation of lawns, or re-use as water for the flushing of toilets, or for fire-fighting purposes. This could reduce the overall water requirement of the development substantially.

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 according to Section 21 of the National Water Act, 1998 (Act No. 36 of 1998).

6.4.7 REFUSE REMOVAL

During the construction phase, solid waste will mainly consist of vegetation material as a result 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. The proposed development site is relatively close to Virginia town and household waste can be taken to the municipal landfill site, regularly.

During the operational phase (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 zinced steel) frames and piles of the mounting systems. Corona Energy will enter into an agreement with the Matjhabeng 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 is included in the Draft EMPr, attached to the Draft and Final EIA Reports.

6.5 TEMPORARY CONSTRUCTION CAMP

The construction camp (approximately 20 ha) will be located within the planned development area, close to the new on-site substation, **on the area which is 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 sizes of the construction camp and the BESS will be, approximately the same.

The optimal location of the construction site is important during the planning phase in order to minimize impacts on the surrounding environment. The site's location is 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 must 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.

In addition, to ensure environmental compatibility, the following factors will be 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.

Table 12. Geographical coordinates of the temporary construction camp

Temporary construction camp (within the development area / footprint)		
Point	**Longitude**	**Latitude**
P1	26° 56' 37.10" E	28° 11' 52.65" S
P2	26° 56' 37.07" E	28° 12' 09.61" S
P3	26° 56' 58.83" E	28° 12' 09.62" S
P4	26° 56' 58.82" E	28° 12' 06.78" S
P5	26° 56' 58.82" E	28° 12' 04.87" S
P6	26° 56' 58.82" E	28° 12' 03.94" S
P7	26° 56' 51.05" E	28° 11' 59.64" S
P8	26° 56' 37.62" E	28° 11' 52.19" S
overall footprint: up to 20 ha		

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.

6.5.1 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.

6.5.2 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.

6.5.3 PHASE III

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

6.5.4 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 may require accommodation in the site;
- technical cabins and management offices;
- medical care unit in a prefabricated module, to allow immediate first aid and emergencies;
- recreation area and canteen (prefabricated modules);
- parking lots for employees, for visiting staff, and 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; and
- solid waste collection point.

6.5.5 EARTHWORKS

Clearing activity is required to remove shrubs and trees from the planned footprint (±508 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. 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. The amount of cut or fill is estimated to be approximately 54 000 m^3. 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 in excess of 500 mm cut or fill. Only the foundation plate for the small high-voltage substation may require earthworks in excess of 500 mm cut or fill (the footprint will be up to 11,000 m2). 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.

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7 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.).

7.1 REGULATORY AUTHORITIES

7.1.1 NATIONAL AUTHORITIES

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

- *Department of Mineral Resources and Energy (DMRE):* This Department is the competent and responsible authority for all policies related to energy, including renewable energy. Solar energy is contemplated and disciplined under the White Paper for Renewable Energy.
- *National Department of Forestry, Fisheries and the Environment (DFFE):* This Department is the competent and responsible authority 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 environmental authorisation.
- *National Energy Regulator of South Africa (NERSA):* The Regulator is competent and responsible for regulating all aspects dealing with the electricity sector and issues the licence for independent power producers.
- *South African Heritage Resources Agency (SAHRA):* This Agency is responsible for the protection and the survey, in association with provincial authorities of listed or proclaimed sites, such as urban conservation areas, nature reserves and proclaimed scenic routes under the terms of the National Heritages Resources Act, 1999 (Act no. 25 of 1999).
- *Free State Department of Police, Roads and Transport:* This Department is responsible for all Provincial Road routes in the Free State Province.

7.1.2 PROVINCIAL AUTHORITIES

At provincial level, the main regulatory authority is the *Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (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.

7.1.3 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 Municipality is the *Matjhabeng Local Municipality* which is part of the *Lejweleputswa District Municipality*.

Under the terms of the Municipal System Act, 2000 (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.

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.

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.

7.2 LEGISLATION, REGULATIONS AND GUIDELINES

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

Table 13. Review of relevant legislation

National Legislation	Sections applicable to the proposed project
Constitution of the Republic of South Africa, 1996 (Act no. 108 of 1996)	• 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, 1963 (Act no. 31 of 1963)	• Notice in respect of erection of a boundary fence (S7) • Clearing bush for boundary fencing (S17) • Access to land for purpose of boundary fencing (S18)
Conservation of Agricultural Resources Act, 1983 (Act no. 43 of 1983)	• Prohibition of the spreading of weeds (S5) • Classification of categories of weeds & invader plants & restrictions: where species may occur (Regulation 15 - GN R148) • Requirement and methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R0148)
Environment Conservation Act, 1989 (Act no. 73 of 1989)	• National Noise Control Regulations (GN R154 - 10 January 1992)
National Water Act, 1998 (Act no. 36 of 1998)	• Entrustment of the National Government to the protection of water resources (S3) • Entitlement to use water (S4) - Schedule 1 provides purposes which entitle a person to use water (reasonable domestic use, domestic gardening, animal watering, fire-fighting and recreational use) • Duty of Care to prevent and remedy the 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, 1998 (Act no. 84 of 1998)	• Protected trees
National Environmental Management Act, 1998 (Act no. 107 of 1998)	• 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) (GN R. 326, 327, 325, 324 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).
National Heritage Resources Act, 1999 (Act no. 25 of 1999)	• 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 as well as a permit from SAHRA for the presentation of archaeological sites for promotion of tourism (S44)
National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004)	• Provision for 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 list of: critical endangered species, endangered species, vulnerable species and protected species (S56(1) - 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)
National Environmental Management: Air Quality Act, 2004 (Act no. 39 of 2004)	• Provision for measures in respect of dust control (S32) • Provision for measures to control noise (S34)
National Environmental Management: Waste Management Act, 2008 (Act no. 59 of 2008)	• Waste management measures • Regulations and schedules • Listed activities which require a waste licence

Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	• Health and safety of all involved before and after construction must be protected.

Guideline Documents	Sections applicable to the proposed project
South African National Standard (SANS) 10328, Methods for environmental noise impact assessments in terms of NEMA no. 107 of 1998	• 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
Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads	• 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

Policies and White Papers	Sections applicable to the proposed project
The White Paper on the Energy Policy of the Republic of South Africa (December 1998)	• The White Paper supports investment in renewable energy initiatives, such as the proposed solar power plant project
The White Paper on Renewable Energy (November 2003)	• The White Paper outlines the Government's vision, policy, principles, strategic goals and objectives for the promotion and the implementation of renewable energy in South Africa
Integrated Resource Plan (IRP1) Integrated Resources Plan 2010-2030 (IRP 2010). Update of the Integrated Resources Plan 2010-2030 (IRP 2019)	• 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**.
Renewable Energy IPP Procurement Programme (REIPPPP)	• Renewable Energy IPP Procurement Programme, issued on 3 August 2011 by DoE.
Equator Principles (July 2006)	• 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.

8 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 Corona Solar Park 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 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 **Corona Solar Park** 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.

8.1 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. Corona 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.

9 MOTIVATION FOR PREFERRED DEVELOPMENT FOOTPRINT IN THE PREFERRED SITE

9.1 THE CHOICE OF THE FREE STATE PROVINCE AND SITE LOCATION

The Corona Solar Park will be located in the Free State Province near the town of Virginia. 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, if compared to the Northern and Eastern Cape. Therefore, 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. Therefore, the macro-area where the project is planned never received the benefits - in terms of socio-economic development and local contents - 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 Corona Energy (Pty) Ltd as an ideal macro area for establishing a solar PV plant based on several important considerations:

- solar resource is high: the *global horizontal irradiation* is 2,099 kWh/m^2/year (source: https://solargis.info/imaps/);
- there are few green projects currently under development 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;
- available Eskom grid capacity;
- the presence of several mines in the Welkom and Virginia area which require green energy; 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 Corona Solar Park 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 medium ecological sensitivity of the proposed project site.
- Available Eskom grid connectivity.

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. During the last Round 6 of the REIPP Procurement Programme, **240 MW** was allocated to irginia 1, 2 and 3 Solar Parks, **1020 MW are still available for connection at Distribution Level (132kV).**

Free State Province, local municipalities and communities are eager to start establishing an eco-green image in consideration of the burden of CO_2 emissions they have to bear.

10 DESCRIPTION OF PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT

10.1 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 any proposed development as part of an environmental impact assessment process. A number of possible alternatives for accomplishing the same objectives must be identified and investigated.

The following are taken into account when considering alternatives:

- 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).

10.1.1 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 (±500 ha)
- Current land use
- Environmental impact (biodiversity)
- Agricultural potential
- Solar radiance
- Socio-economic issues (land cost and local community unemployment)
- Occurrence of Heritage resources

10.1.2 SITE ALTERNATIVE 1

- The landowners agreed that the farms De Dam, Biddulph and Tevrede can be used for a PV Park – the total size of these properties amounts to 1 200 ha.
- Small portions of the farms De Dam and Biddulph lies west of the tar road that makes it impractical to develop a portion of the PV Plant there.
- There is a small portion of Te Vrede on the eastern side of the 765 kV powerline traversing the farm that cannot be developed because of hills.

- The Terrestrial Biodiversity Specialist determined the following after a site visit:
  - That the whole of the farm De Dam and a large part of Biddulph is ecologically too sensitive for development. This is because of several drainage channels (Valleybottom wetlands).
  - That the drainage channels on the site suitable for development must also be excluded, resulting in the proposed layout.
  - The vegetation unit is classified as having a medium sensitivity due to the due to the widespread status through the larger project area.
- 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.
- Two Historical Heritage Period settlements or potential settlements (CRS-HP01, CRS-HP02) occurs within the proposed Corona Solar Park Project and the powerline corridor and impact on the sites is likely. However, little remains of the potential settlements in terms of heritage features and material culture and the sites are rated as low significance. Monitoring throughout all phases of the project will be required in order to avoid the potential destruction of undetected heritage sites.
- No fatal flaws were identified for the proposed footprint area.

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, 240 MW has been already allocated to the Virginia 1 and 2 Solar Parks, **1020 MW are still available for connection at Distribution Level (132kV).**

10.1.3 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 of this technology: linear Fresnel, parabolic trough or tower. These technologies can also 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 a minor quantity of 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 located 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 the Mounting System of the PV Modules

Preferred 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. Consequently, the final decision about the mounting system technology will be taken only at commissioning date.

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 (508 ha) and the height of the structures (PV modules and support frames) will be maximum 3.5 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. This means that 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.

BESS Technology alternatives

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;

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.

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

10.1.4.1 NO-GO ALTERNATIVE – NEGATIVE IMPACTS

The no-go alternative is the option of not establishing a PV Power Plant on the site, or any of its alternatives. The environment will remain in its current state (status quo). This will not create any new employment opportunities, and therefore the anticipated economic benefits of the project will accrue to the study area. 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 benefits related to the establishment of a renewable energy power plant 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 CO^2 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: in particular in light of the possible commitment to the Kyoto Protocol.

10.1.4.2 NO-GO ALTERNATIVE – POSITIVE IMPACTS

Should the No-go alternative be selected then the natural area will not be transformed or cleared form natural vegetation or crops and will still be available for agriculture should it be needed. The positive impact will relate mainly to the agricultural sector which could be further developed in this area if the "Do-Nothing" alternative is applied.

10.2 DETAILS OF PUBLIC PARTICIPATION PROCESS UNDERTAKEN

All relevant I&AP's have been identified and involved in the public participation process from the beginning of the project as per sections 54, 55, 56 and 57 of the EIA regulations 2014 (As amended). The public participation process offers the opportunity to become actively involved through constant sharing of information. The main purposes of the public participation process are 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.

In the enclosed Annexure D, 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.

The public was informed of the project by means of:

- Site notices that were put up at the proposed development site at 5 positions on the fences at the proposed development areas on 18 November 2022.
- Background Information Documents (BIDs) were emailed to most of the Authorities involved on 18 November 2022.
- A Notice / Advertisement was published in the Vista local newspaper, appearing on Thursday 17 November 2022 which is distributed in the area.
- Emails of the BID were sent to most of the relevant Authorities and possible interested and affected parties/stakeholders (other I&APs).
- The initial Public Participation Process was conducted from **17 November 2022 until 17 January 2023**.
- BIDs were sent to:
    - Matjhabeng Local Municipality
    - Masilonyana Local Municipality
    - Local Municipalities Ward Councillors
    - Lejweleputswa District Municipality
    - Department of Water & Sanitation
    - Free State Department of Economic, Small Business Development, Tourism & Environment Affairs (DESTEA)

- Eskom
- Department of Minerals and Energy
- DMR (Department of Mineral Resources).
- Department of Science & Technology
- South African Astronomical Observatory (SAAO) and Southern African Large Telescope (SALT)
    - South African Radio Astronomy Observatory (SARAO) and Square Kilometre Array (SKA)
- Council for Scientific and Industrial Research (CSIR)
- SANRAL
- Free State Department of Police, Roads and Transport
- Free State Department of Agriculture and Rural Development
- Free State Department of Cooperative Governance, Traditional Affairs & Human Settlements
- South African Civil Aviation Authority - SACAA
- DFFE: Directorate: Climate Change & Air Quality, Biodiversity & Conservation, Protected Areas Systems Management
- Transnet
- Agri SA
- Free State Agriculture
- Agricultural Research Council
- SAHRA
- Endangered Wildlife Trust (EWT)
- Bird Life SA

- An I&AP Register was opened which will be maintained and updated as required.
- Few people registered as I&APs, but no comments were received during the initial public participation process from adjacent landowners and/or interested and/or affected parties.
- Scoping approval from the DFFE was received on 26 April 2023.
- The Draft EIA Report (in electronic format) was made available for a 30-day commenting period.

10.2.1 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:

- The Final EIA Report will be submitted to DFFE for review and approval.
- Registered I&APs and governmental organisations will be notified about the final decision of DFFE (Environmental Authorisation granted or not).

10.3 TABLE OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
18/11/2022 **CONRAD VAN BILJON** **EMAIL** **ABERDARE**	To Whom it may concern Aberdare Cables is a local level 1 BEE manufacturer of electrical cables and a market leader in the renewable sector. 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. Below are all my contact details should you have any enquiries. Thanking You	**18/11/2022** **EMAIL-AGES** Thank you for your email. 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. Kind regards
18/11/2022 **EMAIL** **KATHRYN WINSTANLEY** **G7ENERGIES**	Dear Hiadee, I trust you are well. 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: Virginia 4 SP, Quagga SP, Corona SP, Florida 1 & 2 SP. Thank you very much. With kind regards,	**10/01/2023** **EMAIL- AGES** Dear Kathryn Confirmed. eia@g7energies.com is also receiving emails. The Draft Reports will be forwarded as soon as they are available. Kind regards
23/11/2022 **EMAIL** **BOITUMELO MELATO** **DEPARTMENT OF WATER AND SANITATION**	Good day Hiadee, Hope this mail finds you well. 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,	**17/01/2023** **EMAIL- AGES** Dear Melato, Thank you for your email. I did send the emails to the relevant officers, but to date no-one has responded with a case officer detail. The Draft Scoping Report will go out for comments shortly, so I will forward the link to all of the above. Kind regards
28/11/2022 **EMAIL**	Good day	**28/11/2022** **EMAIL**

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
MELANIE MILES **DEPUTY HOD** **PROJECTS** **LEADS 2 BUSINESS**	Please could you forward me a BID document and register me as an interested and affected party for the following 5 projects: Virginia 4 Solar Park Quagga Solar Park Florida 1 & 2 Solar Parks Corona Solar Park I look forward to your response. Kind Regards	**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
	Thank you so much :) Kind Regards	

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
30/11/2022 **EMAIL** **NOKUKHANYA GASA** **ARC.** **AGRICULTURAL RESEARCH COUNCIL**	**FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS: BACKGROUND INFORMATION DOCUMENT – NOVEMBER 2022** **RESPONSE FORM** **FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS** **CONTACT DETAILS:** **Title:** Miss **First Name:** NOKUKHANYA **Surname:** GASA **E-mail:** GasaN@arc.agric.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 8783 **Town:** Pretoria **Code:** 0001 **YOUR INTEREST IN THE MATTER:** 1. What is your main area of interest with regards to the proposed project? To know the progress on the application as it proceeds. 2. Are there any concerns you would like to raise, at this stage, regarding the proposed project? None at this stage. 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 **THANK YOU FOR YOUR TIME** **Please add more pages if necessary**	**30/11/2022** **EMAIL** **AGES** Dear Nokukhanya Thank you for your registration. You have been added to the I&AP list and we will keep you informed as the process proceeds. Kind regards

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
02/12/2022 **EMAIL** **THOMAS WILSON SENIOR ENVIRONMENTAL MANAGER SUSTAINABLE DEVELOPMENT DEPARTMENT HARMONY GOLD MINING COMPANY LIMITED**	Dear Hiadee, 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.	**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 **11/01/2023** **EMAIL- AGES** Hi Thomas As per my email below, please confirm that the properties in question are Millo 639 remainder and portion 1 that belong to Harmony? Kind regards
14/12/2022 **EMAIL** **DEBBIE WESSELS CONTENT REGULATOR LEADS2BUSINESS**	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? • 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;	**17/12/2022** **EMAIL** **AGES** Hi Debbie I think its just for REGISTRATION DIVISION. A map reference. Kind regards

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	• Farm DELAPORTE 887 and Farm QUAGGAFONTEIN 3, WINBURG RD; Never seen that before and wondered what it meant? Kind Regards	
09/02/2023 **EMAIL**	Hi Haidee Thanks so much and compliments of the season. Kind Regards	
18/01/2023 **EMAIL** **BOITUMELO MELATO** **DWS**	Good day Hiadee, 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	**19/01/2023** **EMAIL** **AGES Limpopo** Dear Boitumelo Melato Thank you so much for your registration. The draft Scoping report will be sent to you shortly. Kind regards

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	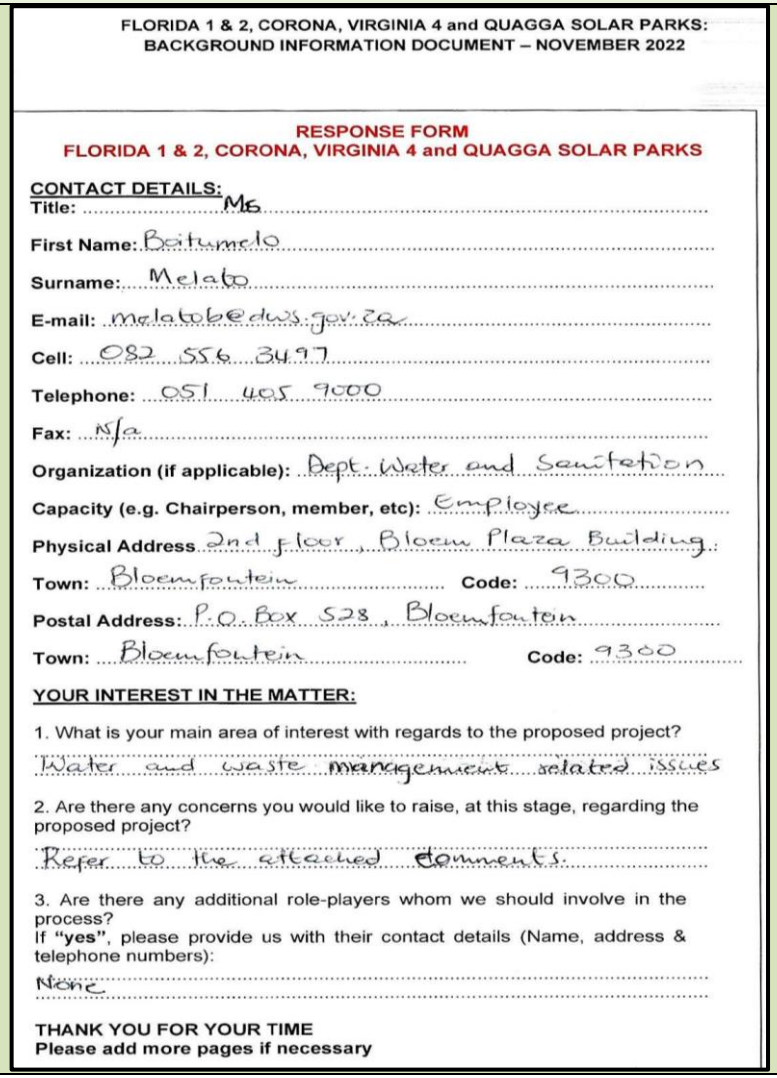	

FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS:
BACKGROUND INFORMATION DOCUMENT – NOVEMBER 2022

RESPONSE FORM
FLORIDA 1 & 2, CORONA, VIRGINIA 4 and QUAGGA SOLAR PARKS

CONTACT DETAILS:
Title: Ms
First Name: Boitumelo
Surname: Melato
E-mail: melatob@dws.gov.za
Cell: 082 556 3497
Telephone: 051 405 9000
Fax: N/a
Organization (if applicable): Dept. Water and Sanitation
Capacity (e.g. Chairperson, member, etc): Employee
Physical Address 2nd floor, Bloem Plaza Building.
Town: Bloemfontein **Code:** 9300
Postal Address: P.O. Box 528, Bloemfontein
Town: Bloemfontein **Code:** 9300

YOUR INTEREST IN THE MATTER:

1. What is your main area of interest with regards to the proposed project?
Water and waste management related issues

2. Are there any concerns you would like to raise, at this stage, regarding the proposed project?
Refer to the attached comments.

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):
None

THANK YOU FOR YOUR TIME
Please add more pages if necessary

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Comments for the Virginia 4 SP, Quagga SP Corona SP , Florida 1 & 2 SP BIDS • 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. • Any activity which is located within 100m of the water resource needs to be authorised by the Department. The authorisation must be obtained prior commencement of the project. • Erosion and stormwater management must be put in place through all stages of the project • All sections of the National Environmental Act: Waste Act (Act 59 of 2008) pertaining to the disposal of waste must be adhered to. • 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. • 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. • 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: *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".* Therefore, any pollution incident(s) originating from this project shall be reported to Department of Water Sanitation: Free State Operations within 24 hours.	
(24/01/2023) 10/03/2023 EMAIL	Good day Tobie, RE: Proposed Solar PV Facility	**24/01/2023 EMAIL TOBIE DU TOIT**

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
VUSI NKOSI OBSTACLE ADMINISTRATOR | COO - AIR TRAFFIC SERVICES	This is to acknowledge that ATNS has received your query. Below is the criteria for obstacle evaluation according to the regulations: • If the Solar PV installation is equal to or bigger than 5000 square meters; • If the Solar PV installation falls within a 8km radius around any aerodrome/airstrip or helipad; • If the Solar PV installation falls within the Approach and Departure area of any aerodrome/airstrip or helipad and • If the Solar PV installation falls within 3km radius of any aerodrome/airstrip or helipad a glint and glare assessment is required from the applicant. *Please Note the above is requirements for aviation purposes but if your development does fall outside of the above and you still need approval or letter based on other departments within the EIA process, you will still need to apply for assessments before we or the CAA can issue this approval or letter. Kindly note that ATNS charge for the assessment, and before the process start our Business Development department will forward a proposal to the client. The proposal and payment process are as follows if applicable: • You will receive the proposal from our Business Development department, it will contain the work that will be done as well as what it will cost. • They will provide you with all the information needed to make payment. For this reason, please provide a billing address and the details of the person to whom the proposal should be addressed. • We will start with the assessments when our Business Development department received an accepted and signed proposal back from the client. We will conduct an assessment to evaluate whether the proposed structures will affect the safety of flight for aerodromes in close vicinity as well as communication, navigation and surveillance (CNS) equipment. Please see required information below before we can proceed with our assessment:	**SPECIALIST** Dear Winnie, CORONA ENERGY (PTY) LTD (PTY) LTD, is proposing the establishment of a renewable energy generation facilities (Photovoltaic Power Plants) 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. The proposed location of the Corona Photovoltaic Power Plant is on the Farms BIDDULPH 329, DE DAM 27 and TEVREDE 361, VENTERSBURG RD, located within the Matjabeng Local Municipality, Lejweleputswa District Municipality, Free State Province. 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. I therefore apply for approval from ATNS through the obstacle committee for approval to continue with the Corona 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. 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. Thank you for your assistance. Kind regards,

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	• A KMZ file with the positions of the proposed structures • A Glint and Glare assessment report (if it is within the 3km radius of any aerodrome/airstrip or helipad). This whole process can take up to 120 working days' minimum that will commence after the proposal is accepted, signed and received by our Business Development department. Please note that ATNS also liaise with the South Africa Civil Aviation Authority (SACAA) and will provide the client with the conditional/final approval from the SACAA. The client will have to liaise with SACAA to finalise the "As build" and for any queries with the lighting.	
13/02/2023 EMAIL KAMOGELO MATHETJA DFFE DIRECTORATE: BIODIVERSITY CONSERVATION	Dear Sir/Madam 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. 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 Regards,	
22/02/2023 EMAIL LYDIA KUTU INTEGRATED ENVIRONMENTAL AUTHORISATIONS: PRIORITY INFRASTRUCTURE DEVELOPMENTS	Good day. Please find herein the attached letter for the above mentioned. 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. I hope you find all in order.	

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Thank you.	
22/02/2023/ EMAIL MS MILLICENT SOLOMONS ACTING CHIEF DIRECTOR: INTEGRATED ENVIRONMENTAL AUTHORISATIONS DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT LETTER SIGNED BY: MS MASINA MORUDU DESIGNATION: CONTROL ENVIRONMENTAL OFFICER: NATIONAL INFRASTRUCTURE PROJECTS	**COMMENTS ON THE DRAFT SCOPING REPORTS FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE.** The Applications for Environmental Authorisation and the Draft Scoping Reports (SR's) dated February 2023 and received by the Department on 01 February 2023, refer. <u>This letter serves to inform you that the following information must be included to the Final Scoping Report:</u> **(a)**Written confirmation from Eskom that there is capacity in the network for the proposed Corona Solar PV to be connected to the Eskom Theseus Substation (MTS) which is located approximately 12 km northwest of the project site, should a positive decision be obtained.	**COMMENTS AND RESPONSES ON THE DRAFT SCOPING REPORTS FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE.** The following responses are hereby submitted on comments received from DFFE dated 22 February 2023. <u>The following information must be included to the Final Scoping Report.</u> Written confirmation from Eskom that there is capacity in the network for the proposed Corona Solar PV to be connected to the Eskom Theseus Substation (MTS), located approximately 12 km northwest of the project site, will be submitted in the EIA Phase. Liaising with Eskom has taken place already but written confirmation has not been obtained, yet as this is another separate timeous process.
	(a) <u>Listed Activities and Application Form</u> • Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. Please provide the details, capacities and thresholds of the specific project infrastructure, not a repetition of the listed activity thresholds (i.e., a description of the dangerous goods facility infrastructure, capacity and location, and the length and width of the main access roads.	***(a)*** **<u>Listed Activities and Application Form</u>** • All relevant listed activities are applied for and can be linked to the development activity or infrastructure as described in the project description. All details are provided in the listed activities table 3 in section 3.3 of the final Scoping report.
	• If the activities applied for in the application form differ from those mentioned in the final SR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms.	• The application form was reviewed and the activities in the application form and those mentioned in the final SR corresponds.

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	(b) <u>Layout & Sensitivity Maps</u> ➢ The report, for the proposed Corona Solar PV, must also include a sensitivity map that shows a sensitivity map of the area	***(b)*** **<u>Layout & Sensitivity Maps</u>** ➢ The sensitivity maps of the solar park area as well as the powerline is attached in Annexure A as CSP03-CSP06
	➢ Please provide Global Positioning System coordinates for the Corona Solar PV and Power line in ***degrees minutes and seconds***. For a linear development, include the start, middle and end point coordinates.	➢ All the powerline coordinates indicating the start , middle and end as well as the turning points are indicated in the Final scoping report Section 4.2.2, Table 7. The co-ordinates of the Solar PV are attached in the Final Scoping Report in Section 4.1, Table 4. The coordinates of the panels, and BESS is given in Table 5 and Table 6 of the Final Scoping Report.
	➢ Please provide a layout map which indicates the following: • All supporting onsite infrastructure e.g. roads; • The location of sensitive environmental features on site e.g. CBAs, heritage sites, wetlands, drainage lines etc. that will be affected, • Buffer areas; and • All "no-go" areas. • The above map must be overlain with a sensitivity map and a cumulative map which shows existing solar power plants and their associated infrastructure. • Please be advised that Google maps will not be accepted.	➢ Attached in Annexure A of the Final Scoping report the following maps are included according to the list of required maps: CSP 03; CSP 04; CSP 05 and CSP06 – sensitivity overlay maps. CSP 07 – cumulative map indicating other applications in the area. CSP08 combines the development area map with CBA areas. CSP09 Is a layout with all infrastructure, buffers, heritage sites and No-Go areas. No solar power plants have been constructed in the area of Corona Solar PV yet, however, a map indicating the locality of planned solar plants in the area is included in the Final Scoping Report in section 6.2.2, Figure 10.
	(c) <u>Public Participation Process</u> • The final SR must provide evidence that all identified and relevant commenting authorities have been given an opportunity to comment on the proposed development, including but not limited to the Fisheries and the Environment (DFFE): Biodiversity Conservation (BCAdmin@environment.gov.za), the Department of Water and Sanitation, the relevant heritage authorities, the affected district and local municipalities and other I&APs (such as **Fornax Energy (Pty) Ltd-Virginia Solar PV 1, 2, 3 & 4).**	**<u>c) Public Participation Process</u>** • The final SR will provides evidence that all identified and relevant commenting authorities have been given an opportunity to comment on the proposed development, including but not limited to the Fisheries and the Environment (DFFE): Biodiversity Conservation (BCAdmin@environment.gov.za), the Department of Water and Sanitation, the relevant heritage authorities, the affected district and local municipalities and other I&APs (such as Fornax Energy (Pty) Ltd - Virginia Solar PV 1, 2, 3 & 4). In the C&R report in Annexure C, it's indicated that Virginia 1,2,3,4 Florida and Quagga solar parks have been taken into consideration.

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	• Proof of correspondence with the various stakeholders must be included in the Final SR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40 41, 42, 43 & 44 of the EIA Regulations 2014, as amended and the approved Public Participation Plan	• Proof of correspondence with the various stakeholders are included in the Final SR in the C&R report in Annexure C
	• A comments and response trail report (C&R) must be submitted with the final SR. The C&R report must be a separate document from the main report and the format must be in the table format, which reflects the details of the interested and affected parties (I&APs) and the date comments were received, actual comments received, and responses provided. 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 (including this Department's comments) in respect of the proposed activity are adequately addressed. Comments made by I&APs must be comprehensively captured (copy verbatim if required) and responded to clearly and fully. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments.	• A Comments & responses trail report in table format is submitted with the final SR. It is a separate document from the main report attached as Annexure C. All issues raised and comments received during the circulation of the SR from registered I&APs and organs of state which have jurisdiction (including this Department's comments) in respect of the proposed activity are adequately addressed. Comments made by I&APs are comprehensively captured.
	(d) <u>Specialist Assessments to be conducted in the EIA phase</u> • Specialist studies must include a detailed description of the study's methodology, an indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisation.	**<u>d) Specialist Assessments to be conducted in the EIA phase</u>** • Specialist studies done include a detailed description of the study's methodology, an indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for Authorisation.
	• The specialist studies must also provide a detailed description of all limitations to their studies. All specialist studies must be conducted in the right season and providing that as a limitation, will not be accepted.	• The specialist assessments do include a description of all limitations to their studies. The specialist assessments were all conducted during the right season.
	• Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and where necessary, include further expertise advice.	• During the EIA phase the assessments of the appointed specialists will be scrutinized for any contradicting recommendations and the most reasonable recommendation will be indicated with defendable reasons. If necessary, further expert advice will be included. Thus far, the specialists have not specified any contradicting recommendations.

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	• Should the specialist studies require additional studies to be undertaken, these must be commissioned and included in the draft EIA reports for public comment.	• Although the avifauna sensitivity was regarded as low, the avifauna specialist strongly suggested a follow-up survey to confirm the low sensitivity at the end of the wet season. The preliminary visual impact assessment must be expanded into a full Visual Impact assessment, which will be included in the EIA Report.
	• Declaration forms must be provided for all specialist studies to be conducted.	• The declaration forms for the specialists will be included in the EIA Report.
	• 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, except where the applicant provides proof to the competent authority that the specialist assessment affected by these protocols had been commissioned before the date on which the protocols came into effect, in which case Appendix 6 of the Environmental impact Assessment Regulations, 2014, as amended, will apply.	• The specialist assessments for the EIA Phase will be done according to 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).
	• Please note further that the protocols require certain specialists' to be SACNASP registered. Refer to the relevant protocols in this regard. • Please include a table in the final SR summarising the specialist studies required by the Screening Tool, a column indicating whether these studies will be conducted or not, and a column with motivation for any studies that will not be undertaken. Please note that if any of the specialists' studies and requirements recommended in the Department's Screening Tool are not commissioned, motivation for such must be provided in the report, per the requirements of the Protocols.	• The table is included in the Final Scoping report in Section 6.2.1, Table 7.
	• Where specialist studies are conducted in-house or by a specialist other than a suitably qualified specialist in the relevant field per the requirements of the protocols, such specialist reports must be peer reviewed by a suitably qualified external specialist in the relevant field.	• Specialist reports conducted in-house, will be peer reviewed by a suitably qualified external specialist in the relevant field in the EIA Phase.

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	(e) <u>Cumulative Assessment to be conducted in the EIA phase</u> • 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: ➢ 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.	**e) <u>Cumulative Assessment to be conducted in the EIA phase.</u>** • Cumulative impacts will be identified and defined, and where possible the size of identified impacts will be quantified and indicated, in the EIA Report.
	➢ 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.	➢ Cumulative impacts will be addressed in the EIA Report.
	➢ The cumulative impacts significance rating must also inform the need and desirability of the proposed development.	➢ The cumulative impacts significance rating will inform the need and desirability of the proposed development, which will be included in the EIA Report.
	➢ A cumulative impact environmental statement on whether the proposed development must proceed.	➢ A cumulative impact environmental statement on whether the proposed development must proceed will be provided in the EIA phase.
	<u>General</u> You are further reminded to comply with Regulation 21(1) of the NEMA EIA Regulations 2014, as amended, which states that: *"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".*	**<u>General</u>** The applicant will 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.
	You are 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 of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.	The final SR to be submitted to this Department will comply with all the requirements in terms of the scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations 2014, as amended.

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	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).	It is noted 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).
	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. Yours sincerely	No activity will commence prior to an Environmental Authorisation being granted by the Department. Yours sincerely
01/03/2023 **EMAIL** **MS M RABOTHATA** **DFFE: BIODIVERSITY**	Dear Hiadee, Kindly note that your link has Expired on 14 February 2023 and I couldn't manage to download the report before the expiry date . Please send me the new link or an alternative way to access the report for the above mentioned project.	02/03/2023 WeTransfer link sent. IN RESPONSE 02/03/2023 WeTransfer link downloaded by Ms M Rabothata and M A Mudau
06/03/2023 **EMAIL** **BOITUMELO MELATO DWS** **LETTER SIGNED BY DR T NTILI** **PROVINCIAL HEAD DWS**	Good day, Kindly find the attached for your further attention. Regards,	**13/03/2023** **EMAIL** **AGES Limpopo RESPONSE**

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Dear Sir/Madam **APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED RENEWABLE ENERGY GENERATION PROJECT (PV) ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSW DISTRICT, FREE STATE PROVINCE: CORONA SOLAR PV FACILITY** **AGES REF: L 22 106 E** Reference is hereby made to the document submitted to this Department dated February 2023 for the above-mentioned project as presented to this Department by AGES Limpopo (Pty) Ltd. This office has evaluated the Draft Scoping Report and the comments are as follows. • In Page 62 of The Wetland/Riparian Impact Assessment Report attached as Appendix F it is indicated that two wetland types were identified on the project area. 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. • It is noted that in Page ix: Executive Summary the closest freshwater ecosystem is at a distance greater than 500m form the study area. The 500m distance is greater than the 100m regulated area therefore does not need authorisation from this Department. • In page 31 under 4.2.7.3: Water provision during construction and operation it is noted that water will be obtained from Matjhabeng Local Municipality and/or from on-site boreholes. An agreement letter between the water supplier and the applicant must be in place. • 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 sections of the National Environmental Act: Waste Act (Act 59 of 2008) pertaining to the disposal of waste must be adhered to. • 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.	**APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED RENEWABLE ENERGY GENERATION PROJECT (PV) ON THE FARM TE VREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DE DAM 27 VENTERSBURG RD, AND POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE: CORONA SOLAR PV FACILITY** Dear Sir, With reference to the letter received from the Department, dated 6 March 2023, please note the following response. A Water Use Licence Application will be submitted for the required/applicable water uses as listed in section 21 of the National Water Act, 1998 (Act. No. 36 of 1998), specifically applicable to the proposed Solar Park development. The water uses to be applied for include the following: • Section 21 (c) & (i) as a result of the development within 500m from the boundary of a wetland and/or freshwater system. • Section 21(a), if groundwater is going to be utilized. If not, an agreement will be in place between the developer and the water supplier. • Section 21(g) for the installation of a wastewater treatment system. All further recommendations from DWS will be incorporated into the EIA report and EMPr. A copy of the Draft EIA report will be made available for your perusal, for a period of 30 days once it becomes available. I trust you find this in order.
08/03/2023 EMAIL	Dear Mr von Well,	

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
MS MMATLALA RABOTHATA DEPARTMENT OF FORESTRY FISHERIES AND THE ENVIRONMENT **LETTER SIGNED BY: MR SEOKA LEKOTA CONTROL BIODIVERSITY OFFICER GRADE B: BIODIVERSITY CONSERVATION DEPARTMENT OF FORESTRY, FISHERIES, AND THE ENVIRONMENT**	Please receive the attached comments from Directorate :Biodiversity Conservation for your attention and implementation Regards --- Dear Mr. von Well **COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE** The Directorate: Biodiversity Conservation has reviewed and evaluated the reports and doesn't have any objection to the Scoping Report and the Plan of Study, however, final report must comply with the 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. It is recommended that the PV infrastructure be placed in such a way that they avoid any highly sensitive biodiversity areas. The layout Plan overlaid with biodiversity sensitivities must be included and submitted during the next phase of the EIA. 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.** Yours faithfully	
26/04/2023 EMAIL LYDIA KUTU INTEGRATED ENVIRONMENTAL AUTHORISATIONS:	Good day. Please find herein the attached letter for the above mentioned. 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.	

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
PRIORITY INFRASTRUCTURE DEVELOPMENTS **LETTER FROM; MR SABELO MALAZA CHIEF DIRECTOR; INTEGRATED ENVIRONMENTAL AUTHORISATIONS, DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES, SIGNED BY VUSI SKOSANA/; DIRECTOR: NATIONAL INTEGRATED AUTHORISATIONS**	I hope you find all in order. Thank you. Kind Regards, --- **ACCEPTANCE OF THE FINAL SCOPING REPORT (FSR) FOR THE PROPOSED CORONA SOLAR PARK ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DE DAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE** The final Scoping Report (SR) and the Plan of Study for Environmental Impact Assessment dated March 2023 and received by the Department on 13 March 2023, refer. The Department has evaluated the submitted final SR and the Plan of Study for Environmental Impact Assessment dated March 2023 and is satisfied that the documents comply with the minimum requirements of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended. The FSR is hereby accepted by the Department in terms of Regulation 22(1)(a) of the EIA Regulations, 2014, as amended. 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. 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 the these Regulations, unless an extension has been granted in terms of Regulation 3(7) of the EIA Regulations, 2014, as amended. You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may	--- **APPLICATION AND DRAFT EIA REPORT FOR THE PROPOSED ESTABLISHMENT OF CORONA RENEWABLE ENERGY GENERATION FACILITY WITH ASSOCIATED INFRASTRUCTURE AND CONNECTING POWER LINE, ON DE DAM 27, TEVREDE 361 AND BIDDULPH 329, VENTERSBURG RD AND CONNECTING POWERLINE ON OTHER FARMS, LOCATED WITHIN THE MATHABENG MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE** **PROPOSED SHORT NAME: CORONA SOLAR PARK** Your acceptance of the final Scoping report and the Plan of Study for Environmental Impact Assessment of 26 April 2023 refers. Attached please find the Amended EIA Application form and Draft EIA Report for the above-mentioned Solar Park and connecting power line. For further correspondence, please contact the undersigned. Best Regards,

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	commence prior to an environmental authorisation being granted by the Department. Yours faithfully	
12/06/2023 **EMAIL** **SIMPHIWE MASILELA** **INSPECTOR: OBSTACLES AERODROME INFRASTRUCTURE** **SACAA**	Good day, The SACAA has no objection to the proposed development, however, a formal obstacle assessment must be conducted in order to determine whether the proposed will affect the safety of flights in any way. Kindly note that the SACAA has transferred the assessments for Solar applications to Air Traffic and Navigation Services (ATNS) as published on the SACAA website. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Solar assessments. The contact details for ATNS are: Obstacle Evaluator ATNS Head Office Tel: +2711 6071000 (Ask for Obstacle Evaluators) Email: Obstacles@atns.co.za For any other obstacle applications, kindly refer to the current obstacle application procedures and processes to follow, as per the SACAA website: Find attached information for Developments around aerodromes and prescribed in SACAA Regulations, processes, and procedures to follow. More information can be obtained at http://www.caa.co.za. Click on information for industry under 'Obstacles'. There is a fee applicable to the said application as well, which is currently R1020 (any changes to this fee will be published on the website). Assessments will commence upon receipt of payment and once the database is updated. Applications must be forwarded to obstacles@caa.co.za together with the following: • A kmz/kml (Google Earth) file reflecting the footprint to the proposed development site • Provide coordinates (deg, min, sec), Height and Elevation.	18/07/2023 email AGES LIMPOPO RESPONSE Dear Simphiwe Thank you for your response. Our aviation Specialist Mr Tobie du Toit is handling this application with ATNS. Kind regards

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	• Also indicate the highest structure of the project (to the top) • Site Plans or drawings of the proposed to further understand the nature of the obstacle and any other supporting documents. Should you require more information please contact the inspectorate at **obstacles@caa.co.za** Regards	
13/06/2023 **EMAIL** **KAMOGELO MATHETJA** **DFFE DIRECTORATE: BIODIVERSITY CONSERVATION**	Dear Sir/Madam 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. 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 Regards	ACKNOWLEDGEMENT
27/06/2023 **EMAIL** **LEON MARX** **ADJACENT LANDOWNER**	Hallo Hiadee Please make the download link available again. Thanks	30/06/2023 Wetransfer link sent. 07/07/2023 **LINK NOT DOWNLOADED.**
03/07/2023 **EMAIL** **BOITUMELO MELATO** **DWS**	Good day, Hiadee May you kindly share the We Transfer link so that I can access the annexures. Regards, WETRANSFER FILES DOWNLOADED	03/07/2023 EMAIL AGES LIMPOPO RESPONSE Dear Boitumelo Melato I have sent another link on WeTransfer.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Good day Hiadee, The link is received with thanks and I have downloaded the files. Regards,	Please note the link is ONLY VALID for 7 days, please download it as soon as possible. Kind regards
05/07/2023 **EMAIL** **BOITUMELO MELATO DWS** **LETTER SIGNED BY DR T NTILI** **PROVINCIAL HEAD:FREE STATE DWS**	Good day Hiadee, The link is received with thanks and I have downloaded the files. Regards, **DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361VENTERSBURG RD, BIDDULP 329VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSW DISTRICT, FREE STATE PROVINCE: CORONA SOLAR PARK** **AGES REF: L 22 106 E** **DFFE REF: 14/12/16/3/3/2/2297** **Applicant: Corona Energy (Pty) Ltd** Reference is hereby made to the document submitted to this Department dated June 2023 for the above-mentioned project as presented to this Department by AGES Limpopo (Pty) Ltd. This office has evaluated the Draft Environmental Impact Assessment Report and it has been noted that the comments dated 06 March 2023 that have been sent to your office for the Draft Scoping Report will be addressed. All the commitments stipulated in the various parts of this report must be adhered to and any deviations must be reported to this Department. 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. Yours sincerely,	06/07/2023 Email AGES LIMPOPO RESPONSE Dear Boitumelo Thank you so much, your comments are really appreciated! Kind regards --- 07/06/2023 EMAIL AGES LIMPOPO RESPONSE TO COMMENTS Dear Madam, **DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361, BIDDULP 329 AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE: CORONA SOLAR PARK** With reference to a letter received from DWS, dated 5 July 2023 regarding the Draft EIA Report, sent for the abovementioned project. All commitments as included in both the Scoping and EIA reports will be honoured and adhered to and any deviations will be reported to DWS. For any queries, please contact Mr Johan Botha on jbotha@aqes-qroup.com Kind Regards,

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
05/07/2023 **EMAIL** **MR KAMOGELO MATHETJA** **BIODIVERSITY & CONSERVATION DEPARTMENT OF FORESTRY FISHERIES AND THE ENVIRONMENT** **LETTER FROM** **MR. SEOKA LEKOTA** **CONTROL BIODIVERSITY OFFICER GRADE B: BIODIVERSITY CONSERVATION DEPARTMENT OF FORESTRY, FISHERIES & THE ENVIRONMENT** **LETTER SIGNED BY:** **MS. P MAKITLA** **DESIGNATION:** **CONTROL BIODIVERSITY OFFICER GRADE A**	Good day, Kindly find the attached comments for your implementation. --- **COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORTS FOR THE PROPOSED PHOTOVOLTAIC VIRGINIA 4, CORONA AND QUAGGA SOLAR PARKS ON THE FARMS BLOMSKRAAL 216, TEVREDE 361, BIDDULPH 329, DE DAM 27, QUAGGAFONTEIN 3, AND DELAPORTE 887, WINBURG RD WITH RESPECTIVE CONNECTING 132 kV POWERLINES, MATJHABENG & MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE** The Directorate: Biodiversity Conservation reviewed and evaluated the afore-mentioned report. Based on the information provided in the report, 129 bird species were recorded in and around the the Proposed Area of Interest (PAOI), with 95 species recorded from point counts and an additional 34 species recorded as incidental. These species include 3 avifaunal Species of Conservation Concern (SCC) namely, Secretary bird (Sagittarius serpentarius), Lanner Falcon (Falco biarmicus) and Blue Korhaan (Eupodotis caerulenscens). Two wetland types were identified on the site namely: Valley bottom wetland with channel, Depressions: Exorheic depressions (man-made dams) and 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. Lastly, most of the proposed solar parks and portions of the connection line do overlap with the Priority Focus Areas, as per the National Protected Areas Expansion Strategy (NPAES) namely, Free State Highveld Grasslands. These are areas contributing towards meeting biodiversity thresholds for terrestrial or freshwater ecosystems, maintaining ecological processes or climate change resilience. Therefore, they are given highest priorities for protected area expansion to meet those targets. Furthermore, the Quagga Solar Park overlaps with Optimal Critical Biodiversity Area (CBA 2).	13/07/2023 EMAIL AGES LIMPOPO --- **COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORTS FOR THE PROPOSED PHOTOVOLTAIC VIRGINIA 4, CORONA AND QUAGGA SOLAR PARKS ON THE FARMS BLOMSKRAAL 216, TEVREDE 361, BIDDULPH 329, DE DAM 27, QUAGGAFONTEIN 3, AND DELAPORTE 887, WINBURG RD WITH RESPECTIVE CONNECTING 132 kV POWERLINES, MATJHABENG & MASILONYANA LOCAL MUNICIPALITIES, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE** Your comments dated 5 July 2023 are appreciated. Please see our response in italics below each recommendation.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
---------- 13/07/2023 EMAIL	Given the above, the Directorate Biodiversity Conservation supports the development provided that all the recommended measures are adhered to including the following: • Overhead cables/lines across water resource areas must be fitted with industry standard bird flight diverters to make the lines as visible as possible to collision-susceptible species. ---------- • Monitoring by an avifauna specialist must be done throughout the development phases. Standard methods as per the species protocols must be followed. ---------- • Powerline pylons must be located outside the recommended buffer zones. ---------- • The proposed solar park and connection line overlap with the Priority Focus Areas, as per the National Protected Areas Expansion Strategy (NPAES) (Free State Highveld Grasslands), Comments from the DFFE Directorate: Protected Areas Planning and Management Effectiveness must be obtained at email: TNethononda@environment.gov.za for attention of Mr. Thivhulawi Nethononda ---------- 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. Yours faithfully ---------- Well received and the correspondence has been noted,	The bird specialist recommended that 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. These recommendations are included in the final EIAr and EMPr. ---------- The bird specialist recommended that monitoring should be conducted between September and February so that mitigation measures can be adapted to ensure the development does not have a long-term impact on the SCCs in the area. 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. ---------- It is recommended in the final EIAR and EMPr that the pylons must be located outside sensitive areas as far as possible. ----------. The Directorate: Protected Areas Planning and Management Effectiveness have been included in the I&AP distribution list since the start of the EIA studies. All reports have been sent via electronic links to Sydney Nkosi and Skumsa Mancotywa as per the contact details provided on the DFFE website, however no comments from this Directorate have been received to date. The reports have now been forwarded to Mr Nethononda for comment. Any comments received from Mr Nethononda herein will be forwarded to BCAdmin@environment.gov.za and yourself upon receipt thereof. ---------- All correspondence for these projects was sent to BCAdmin@environment.gov.za as well as to five other officials. Kind Regards, ---------- Dear Mr Kamogelo, Mathetja

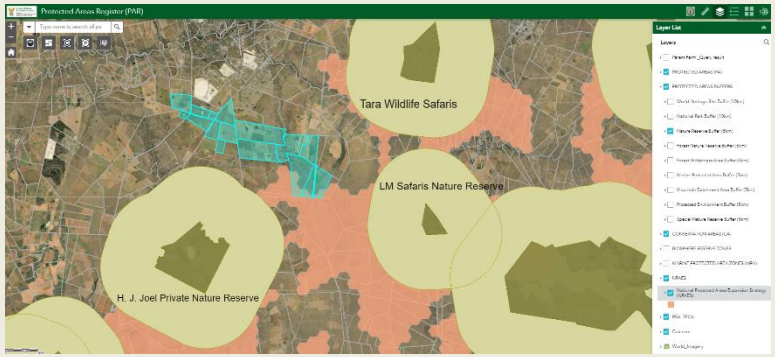
DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Regards,	Attached please find AGES response to the comments on the DEIAR for VIRGINIA 4, CORONA, AND QUAGGA solar parks. Kind regards
07/07/2023 **EMAIL** **EPHRON MARADWA** **LETTER DATED 05/07/2023.** **MR SABELO MALAZA** **CHIEF DIRECTOR: INTEGRATED ENVIRONMENTAL AUTHORISATIONS** **DEPARTMENT OF FORESTRY, FISHERIES, AND THE ENVIRONMENT** **SIGNED BY: MS MASINA MORUDU** **DESIGNATION: CONTROL ENVIRONMENTAL OFFICER: NATIONAL INTEGRATED AUTHORISATIONS**	Good day. Please find herein the attached letter for the above mentioned. 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. I hope you find all in order. EIA Applications Integrated Environmental Authorisations Department of Forestry, Fisheries, and the Environment Please note that this email is for the receipt and processing of online applications only and is not monitored for responses. All queries must be directed to EIAadmin@dffe.gov.za. You are advised that this mailbox has a 48-hour response time. Please note that this mailbox has a 5mb mail limit. No zip files are to be attached in any email. ---------- **COMMENTS ON THE AMENDED DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED CORONA SOLAR PARK ON THE FARMS TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DE DAM 27 VENTERSBURG RD, AND CONNECTING 132 kV POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE.** The Application for Environmental Authorisation and Draft Environmental Impact Assessment Report (EIAr) received by the Department on 06 June 2023, refer.	---------- **COMMENTS AND RESPONSES ON THE DRAFT EIA REPORTS FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM TEVREDE 361 VENTERSBURG RD, BIDDULPH 329 VENTERSBURG RD AND DEDAM 27 VENTERSBURG RD, AND CONNECTING POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT, FREE STATE PROVINCE.** The following responses are hereby submitted on comments received from DFFE dated 5 July 2023.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	This letter serves to inform you that the following information must be included in the final EIAr: **(a) Specific comments** • Please provide contact details in the form of an email address for Dr Sandile Fuku based in the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs, when submitting the final EIAr. --- • Recommendations provided by specialist reports must be considered and used to inform the preferred layout alternative. --- • The EMPr must include a provision to make the following reports available to the Department and applicable competent authority on request: alien/invasive plant management report; plant rescue and protection report; and re-vegetation and habitat rehabilitation report. --- • Please ensure that all mitigation recommendations are in line with applicable and most recent guidelines. --- **(b) Environmental Management Programme** • The EMPr must also include the following: • All recommendations and mitigation measures recorded in the EIAr and the specialist studies conducted. --- • In addition to the above, the EMPr must comply with Appendix 4 of the EIA Regulations, 2014, as amended. --- ---c) **Public Participation Process** • The following information must still be submitted with the final EIAr: a. A list of registered interested and affected parties as per Regulation 42 of the NEMA EIA Regulations, 2014, as amended. --- b. Copies of all comments received during the draft EIAr comment period; and	<u>The following information must be included to the Final EIA Report.</u> **a) <u>Specific comments</u>** The Email address for Dr Sandile Fuku is as follows: **fukus@destea.gov.za** or **sandilefuku@gmail.com** The telephone number for Dr Fuku is: **071 633 2154.** --- The recommendations provided by the specialist reports were used to inform the preferred layout alternative. --- All the mentioned reports are part of the attached Annexures of the final EIAr and are attached in Annexure S of the FEIAr --- The mitigation recommendations are in line with applicable and most recent guidelines. --- b) **<u>Environmental Management Programme</u>** The recommendations and the mitigation measures recorded in the EIAr and specialist studies were used to compile the EMPr. --- The EMPr was compiled according to Appendix 4 of the EIA Regulations, 2014, as amended. --- **c) <u>Public Participation Process</u>** **The list** of registered interested and affected parties as per Regulation 42 of the NEMA EIA Regulations, 2014, as amended, forms part of the Comments and Responses report as part of the final EIAr. ---

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	c. A comment and response report which contains all comments received and responses provided to all comments and issues raised during the public participation process for the draft EIAr. Please note that comments received from this Department must also form part of the comment and response report. --- • Please ensure that all issues raised, and comments received during the circulation of the draft EIAr from registered I&APs and organs of state which have jurisdiction (including this Department's Biodiversity Section (including the following Department's Directorate; Air Quality Management, Waste Licensing and/or Biodiversity) 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. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended. --- **General** Please also ensure that the final EIAr includes the period for which the Environmental Authorisation is required and the date on which the activity will be concluded as per Appendix 3 of the NEMA EIA Regulations, 2014, as amended. --- You are further reminded to comply with Regulation 23(1)(a) of the NEMA EIA Regulations, 2014, as amended, which states that: "The applicant must within 106 days of the acceptance of the scoping report submit to the competent authority - (a) an environmental impact assessment report inclusive of any specialist reports, an EMPr, a closure plan in the case of a closure activity and where the application is a mining application, the plans, report and calculations contemplated in the Financial Provisioning Regulations, which must have been subjected to a public participation process of at least 30	**Copies of all comments** received is incorporated in the Comments and Responses report as part of the final EIAr. --- **A comments and response report** which contains all comments received and responses provided to all comments and issues raised during the public participation process for the draft EIAr, including the comments and responses from the DFFE is attached as annexure to the final EIAr. --- Comments from I&AP's and all applicable organs of state with jurisdiction in respect of the proposed activity were contacted and the comments were adequately addressed in the final EIAr. --- The proof of correspondence to obtain comments with the various stakeholders are included in the Comments and Responses report as part of the final EIAr. The Public Participation Process was conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended. --- **General** The dates requested are included in the final EIAr as per Appendix 3 of the NEMA EIA Regulations, 2014, as amended. --- The Environmental Impact Assessment report according to the requirements of Regulation 23(1) of the NEMA EIA Regulations 2014, as amended, will be submitted within 106 days of acceptance of the Scoping report. The report was subjected to a 30-day public participation process which reflects the incorporation of comments received, including any comments of the competent authority.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	days and which reflects the incorporation of comments received, including any comments of the competent authority." --- Should there be significant changes or new information that has been added to the EIAr or EMPr which changes or information was not contained in the reports or plans consulted on during the initial public participation process, you are required to comply with Regulation 23(1)(b) of the NEMA EIA Regulations, 2014, as amended, which states: "The applicant must within 106 days of the acceptance of the scoping report submit to the competent authority – (b) a notification in writing that the documents contemplated in sub regulation 1(a) will be submitted within 156 days of acceptance of the scoping report by the competent authority or where regulation 21(2) applies, within 156 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the documents, which changes or information was not contained in the original documents consulted on during the initial public participation process contemplated in sub regulation (1)(a), and that the revised documents contemplated in sub regulation 1(a) will be subjected to another public participation process of at least 30 days". --- Should you fail to meet any of the timeframes stipulated in Regulation 23 of the NEMA EIA Regulations, 2014, as amended, your application will lapse. --- 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. Yours sincerely	--- No significant changes or new information has been added to the EIAr or EMPr which is submitted now. --- It is well understood that the application will lapse should the timeframes, stipulated in Regulation 23 of the NEMA EIA Regulations, 2014, as amended not be met. The final EIAr will be submitted prior to the 106 days expiring. --- The applicant has been 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. Yours sincerely
11/07/2023	LINK DOWNLOADED BY : **lvilakati@dffe.gov.za** **shnkosi@environment.gov.za**	11/07/2023 **EMAIL AND WETRANSFER LINK SENT** AGES LIMPOPO Dear Mr Thivhulawi Nethononda,

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	knaude@dffe.gov.za tnethononda@environment.gov.za	Mr Seoka Lekota from DFFE Biodiversity has requested that we obtain comments from Protected Areas Planning and Management Effectiveness, as the proposed solar parks and connection lines overlap with the Priority Focus Areas, as per the National Protected Areas Expansion Strategy (NPAES) (Free State Highveld Grasslands). We apologise for the late request, as we were only now informed of your involvement in the process. Our previous emails were sent to Sydney Nkosi and Skumsa Mancotywa as per DFFEs website. I have sent you a WETRANSFER link to the Draft EIA Report as the entire report and annexures are too large to email. I have only attached this DEIAR in this email. It would be greatly appreciated if you could provide us with comments. Kind regards
--- **13/07/2023** **EMAIL** **LINDOKUHLE VILAKATI** **PROTECTED AREAS PLANNING AND MANAGEMENT EFFECTIVENESS** **DFFE**	--- Good Day Hiadee, The Directorate: Protected Areas Planning and Management Effectiveness (PAPME), would like to thank you for shared documents and invitation to review the proposed development of a Photovoltaic (PV) Solar Energy Facility and associated infrastructure located near Virginia town in the Free State Province. After conducting the review of the availed documents, we have noted that the proposed development of a solar power plant and grid connection does not take place within any kind of protected area recognized in terms of Section 9 of the National Environmental Management: Protected Areas Act (NEMPAA), Act No. 57 of 2003. The project however does affect the National Protected Areas Expansion Strategy (NPAES), specifically proportions of farm **BIDDULPH 329**, **TEVREDE 361.** The NPAES focus areas for land-based protected area expansion are large, intact, and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation of linkages, corridors as well the expansion of protected areas.	--- 18/07/2023 EMAIL AGES : Dr BJ Henning (Pr.Sci.Nat.) Director / Senior Environmental Scientist For attention: Mr Lindokuhle Vilakati **RESPONSE TO COMMENTS RECEIVED VIA THE DIRECTORATE: PROTECTED AREAS PLANNING AND MANAGEMENT EFFECTIVENESS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED PHOTOVOLTAIC CORONA SOLAR PARK ON THE FARM BLOMSKRAAL 216, VENTERSBURG RD, AND CONNECTING 132kV POWERLINE, MATJHABENG LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE** Your comments dated 13 July 2023 are appreciated and in response to these comments, the specialist would like to add additional information that needs to be reconsidered by the Directorate: Protected Areas Planning and Management Effectiveness. This is with specific reference to the following comment by the directorate:

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	Focus areas present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and their current protection levels as well as threat status as depicted by the National Biodiversity Assessment Reports. Adjacent protected Areas include **the H. J. Joel Private Nature Reserve, LM Safaris Nature Reserve and Tara Wildlife Safaris.** The project does not affect any of the protected areas (nature reserves) or their 5 Km Buffers however a small portion of the NPAES focus areas strategically positioned as a future corridor or linkage in between the PAs is affected. Therefore, the EAP is encouraged to take note of such and also take note that the ecosystem affected is the Central Free State Grassland ecosystem type which is currently classified as (PP) poorly protected by the NPAES 2018. The Directorate does not have any objections to the development, however encroachment into the NPAES focus areas is not supported. Kind Regards, 	*"The Directorate does not have any objections to the development, however encroachment into the NPAES focus areas is not supported."* The biodiversity specialist acknowledges the area for the proposed Corona Solar Park lies **partly** within a NPAES zone – see map below. It is however a limited area as only a small band of the Corona Solar Park coincides with the NPAES zone. The solar park only borders on the NPAES on its southern border. Further aspects which determined and restricted the footprint of the Corona Solar Park are: • Small portions of the farms De Dam and Biddulph lies west of the tar road that makes it impractical to develop a portion of the PV Plant there. • There is a small portion of Te Vrede on the eastern side of the 765 kV powerline traversing the farm that cannot be developed because of the high occurrence of hills. • The preferred position of Corona Solar Park (CSP) was influenced by the ecological sensitivity of the farm, assessed for the development. Several drainage channels (Valleybottom wetlands), on site are deemed sensitive and wereexcluded from the development footprint, resulting in the proposed layout. The vegetation unit, on site, is classified as having a medium sensitivity due to its widespread status through the larger project area. • 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. The biodiversity study specifically identified corridors for the protection of biodiversity as emphasised in the Terrestrial Biodiversity Impact Assessment Report namely the rivers and drainage channels and valley bottom, wetlands/pans with buffers. The drainage channels and sections of natural vegetation will be preserved as corridors in the area and mitigation measures will be implemented to ensure that these habitats are protected. Corridors and linkages of areas with similar habitat are present in the local district where several solar power plants are planned. An important mitigation measure is to leave corridors with indigenous vegetation, natural wetlands/water courses and sensitive habitats in between solar plants and

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
		their associated infrastructure. This was implemented during the Site Sensitivity Verification (SSV) Process to ensure the lowest potential impact on the terrestrial biodiversity of the area. **After the SSV, the layout plan of the Corona Solar Park was specifically amended to avoid the network of linked corridors (Watercourses and wetlands) to ensure that steppingstone corridors are conserved in the larger landscape ensuring the protection of local biodiversity. This was highlighted in the terrestrial biodiversity specialist report compiled for the Corona Solar Park.** Because of the nature of solar plants allowing regrowth of the herbaceous component beneath the solar panels, and few or no emissions and pollutants into air when operational, cumulative impacts to the environment are limited, if compared for example to emissions from fossil fuel burning. Ultimately, solar power plants could reprieve the pressures to use fossil fuels that are associated with numerous cumulative impacts and habitat losses. It can therefore be concluded that the development of the Corona Solar Park appears to be more ideal on a national scale because functional biodiversity corridors will remain. The Solar Park will contribute to power generation in South Africa, without having significant impacts on the terrestrial or aquatic biodiversity of the larger Virginia area. This was considered and implemented for the Corona Solar Park and surrounding solar plants planned in the area. Please do not hesitate to contact me if you have any comments or queries in this regard. Yours truly,
11/07/2023 EMAIL SITYHILELO NGCATSHA SAHRA	Good day, 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: https://sahris.sahra.org.za/. We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions. Please create an application on SAHRIS and upload all documents pertaining to the Environmental Authorisation Application Process. As per section	18/07/2023 EMAIL AGES LIMPOPO Dear Sityhilelo Ngcatsha Thank you for your response. Our Heritage Specialist Neels Kruger is responsible to upload all the relevant documentation in this regard.

DATE OF COMMENT, FORMAT, NAME OF I&AP	COMMENT	RESPONSE FROM EAP/ SPECIALIST / APPLICANT
	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. 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 and pay the required amount of R2000 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' and ensure that all documents produced as part of the EA process are submitted as part of the application. Regards	Kind regards

10.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PROPOSED PV SOLAR PARK

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

10.4.1 PROPERTY DESCRIPTION AND CURRENT LAND USE

The proposed development will be on the **Farm Tevrede 361, Ventersburg RD; Farm Biddulph 329, Ventersburg RD and Farm De Dam 27, Ventersburg RD.** located within the Matjhabeng Local Municipality, Lejweleputswa District Municipality, Free State Province. The project site is located ±12 km southeast of Virginia town and ±22 km South-West of Ventersburg.

Table 14. Site location and Property details

Site location and Property details	
Farm	**Farm TEVREDE 361, Ventersburg RD**
Portion	**Portion 0**
LPI code	F03500000000036100000
Overall Extent	417.4780 hectares
Landowner	Forum SA Trading 124 (Pty) Ltd
Diagram deed number	T26124/1882
Title deed number	T624/2002
Registration date	2020118
Current land use	Grazing, game farming
Farm	**Farm BIDDULPH 329, Ventersburg RD**
Portion	**Portion 0**
LPI code	F03500000000032900000
Overall Extent	598.7216 hectares
Landowner	Forum SA Trading 124 (Pty) Ltd
Diagram deed number	G00/1880
Title deed number	T624/2002
Registration date	2020118
Current land use	Grazing, game farming
Farm	**Farm DE DAM 27, Ventersburg RD**
Portion	**Portion 0**
LPI code	F03500000000002700000
Overall Extent	185.0980 hectares
Landowner	Forum SA Trading 124 (Pty) Ltd
Diagram deed number	T16499/1906
Title deed number	T624/2002
Registration date	2020118
Current land use	Grazing, game farming

The connecting power line will traverse the following farms located within the Matjhabeng Local Municipality, Lejweleputswa District Municipality, Free State Province:

Table 15 Properties crossed by the proposed powerline alignment

Corona 132 kV Powerline: Properties crossed by the proposed powerline alignment	
Farm	**De Dam 27, Ventersburg RD (project site)**
Portion	**Portion 0**
LPI code	F03500000000002700000
Overall Extent	185.0980 hectares
Landowner	Forum SA Trading 124 (Pty) Ltd
Title deed number	T624/2002
Current land use	Grazing, game farming
Farm	**Biddulph 329, Ventersburg RD (project site)**
Portion	**Portion 0**
LPI code	F03500000000032900000
Overall Extent	598.7216 hectares
Landowner	Forum SA Trading 124 (Pty) Ltd
Title deed number	T624/2002
Current land use	Grazing, game farming
Farm	**Le Roux 766, Ventersburg RD**
Portion	**Remaining Extent**
LPI code	F03500000000076600000
Overall Extent	451.3239 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Title deed number	T16446/2011
Current land use	Grazing, game farming
Farm	**Florida 633, Ventersburg RD**
Portion	**Portion 1**
LPI code	F03500000000063300001
Overall Extent	709.5842 hectares
Landowner	PIENAAR ANDRIES BENJAMIN
Title deed number	T11996/1979
Current land use	Grazing, game farming
Farm	**Florida 633, Ventersburg RD**
Portion	**Portion 4**
LPI code	F03500000000063300004
Overall Extent	579.3031 hectares
Landowner	PIENAAR GERTRUIDA THEODORA
Title deed number	T8154/2021
Current land use	Grazing, game farming

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.

10.4.2 ENVIRONMENTAL FEATURES

Environmental Screening Report

Table 16 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	An application will be submitted to the CAA.
Defence				X X		Not deemed necessary
Landscape	X				X	
Paleonthology	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 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 to identify the most suitable site for the development. Results and mitigation measures included in Terrestrial Biodiversity Impact Assessment (Annexure E). No red data fauna was found. Suitable habitat of the spotted necked otter will be excluded from the development.

- **Aquatic Biodiversity Theme**

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

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

- **Avian Species Theme**

  Sensitivity - Low

  The avifaunal assessment conducted (Annexure F) 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. The project area is not located within an Important Birding Area (IBA) according to Birdlife SA IBA program. The avifaunal assessment (Annexure F) concluded that very few sensitive features were identified for the project mainly along the proposed power line.

- **Civil Aviation Theme**

  Sensitivity - Low for Solar Park and High for Power Line (Between 8 and 15 km of other civil aviation aerodrome). Site Sensitivity Verification Report is included in Annexure M. *An application for approval will be submitted to the Civil Aviation Authority.*

- **Defence Theme**

  Sensitivity - Low

- **Paleontological Theme**

  Sensitivity – Very High

  The palaeontologist concluded that it is extremely unlikely that fossils will be exposed as a result 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 in the course of the development, the developer should immediately call a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils (Annexure I).

- **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 E.

- **RFI Theme**

  Sensitivity - Low.

  Radio Frequency Assessment minimum report attached as Annexure N.

- **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 namely that a *large section of the development terrain has a low sensitivity.*

  According to the terrestrial Biodiversity report (Annexure E) 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.

10.4.3 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 30 km from the project site, received and/or applied for Environmental Authorisation according to the DFFE database:

Table 17. 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
2	12/12/20/2666/A	Solar PV	Approved	22
3	12/12/20/2668	Solar PV	Approved	19
4	14/12/16/3/3/1/1322	Solar PV	Approved	19
5	12/12/20/2666	Solar PV	Approved	22
6	12/12/20/2667	Solar PV	Approved	19
7	12/12/20/2668	Solar PV	Approved	19
8	14/12/16/3/3/2/2099	Solar PV	Approved	1 AWARDED IN ROUND 6 OF REIPPPP
9	14/12/16/3/3/2/2100	Solar PV	Approved	4 AWARDED IN ROUND 6 OF REIPPPP
10	14/12/16/3/3/2/2101	Solar PV	Approved	5 AWARDED IN ROUND 6 OF REIPPPP

Table 18. 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
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 AWARDED 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 AWARDED 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 AWARDED IN ROUND 6 OF REIPPPP	100	2022/02/01

According to the DFFE database, the projects in figure below have been approved.

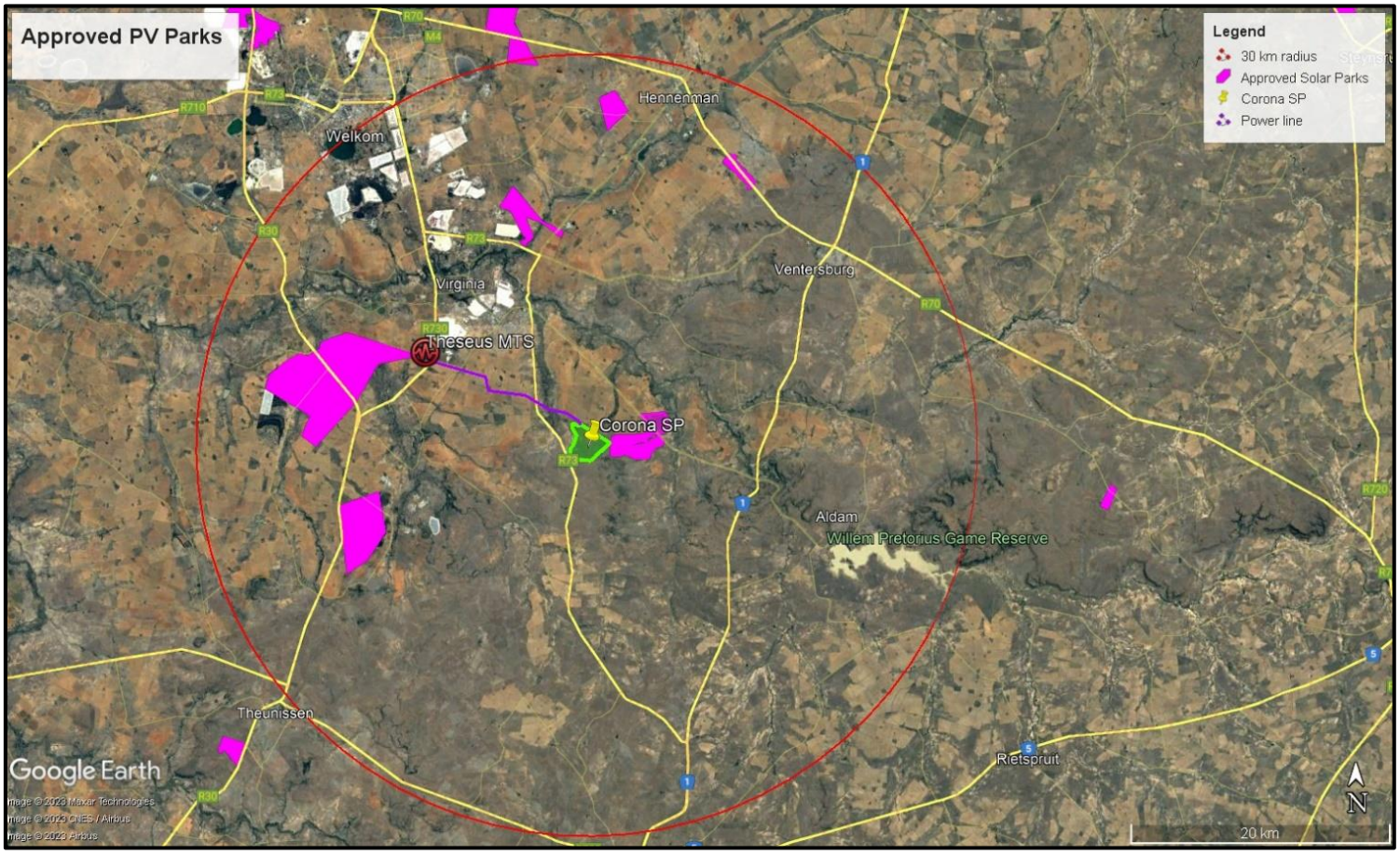


Figure 10. Map of Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed project area

During the last Round 6 of the REIPP Procurement Programme, **240 MW** has already been allocated to the Virginia 1, 2 and 3 Solar Parks, located on Farm Blomskraal 216, Ventersburg RD, adjacent to the project site of the proposed Corona Solar Park.

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 Corona Solar Park, the following solar photovoltaic projects / Environmental Authorisation processes are on-going:

Table 19. 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	Final Scoping Approved	5 km
2	14/12/16/3/3/2/2283	Virginia 4 Solar Park (210 MW) Lupus Energy (Pty) Ltd	Final Scoping Approved	4 km
3	14/12/16/3/3/2/2322	Florida Solar Park (170 MW) Piscis Energy (Pty) Ltd	Final Scoping submitted	3 km

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

10.4.4 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 2 226mm, with Mean Annual Soil Moisture Stress of 78%.

10.4.5 TOPOGRAPHY, DRAINAGE & LAND USE

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 C42K and C42H quaternary catchments and is situated in the Middle Vaal Water Management Area. Drainage occurs as sheet-wash into the drainage channels on site that eventually drains into the major river namely the Merriespruit that occur to the west of the site.

The land-use of the proposed development site is livestock, game and dryland maize cultivation. The surrounding areas are used for cattle, game and crop cultivation. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is **vacant land**.

10.4.6 SOILS AND GEOLOGY

Geoogy is directly related to soil types and plant communities that may occur in a specific area (Van Rooyen & Theron, 1996). A land type unit is a unique combination of soil pattern, terrain and macroclimate, the classification of which is used to determine the potential agricultural value of soils in an area. The land type unit represented within the study area include the Fa14 land type (Land Type Survey Staff, 1987) (ENPAT, 2001). The land type, geology and associated soil types is presented in Table 5 below as classified by the Environmental Potential Atlas, South Africa (ENPAT, 2000).

Table 20. Land types, geology, and dominant soil types of the proposed development site

Landtype	Soils	Geology
Bd20	Plinthic catena: eutrophic; red soils not widespread upland duplex and margalitic soils rare	Shale, mudstone and sandstone of the Ecca and Beaufort Group. Aeolian and possibly colluvial sand overlies the rocks.
Dc8	Prismacutanic and/or pedocutanic diagnostic horizons dominant. In addition, one or more of: vertic melanic red structured diagnostic horizons	Mudstone, shale, sandstone and grit of the Beaufort Group, Karoo Sequence with dolerite sills
Dc12	Prismacutanic and/or pedocutanic diagnostic horizons dominant. In addition, one or more of: vertic, melanic, red structured diagnostic horizons	Mudstone, shale, sandstone and grit of the Beaufort Group, Karoo Sequence, with dolerite sills in places.

Soils associated with the site vary between very sandy on the plateaus and higher lying areas, to dark clayey soils in the low-lying plans and bottomlands.

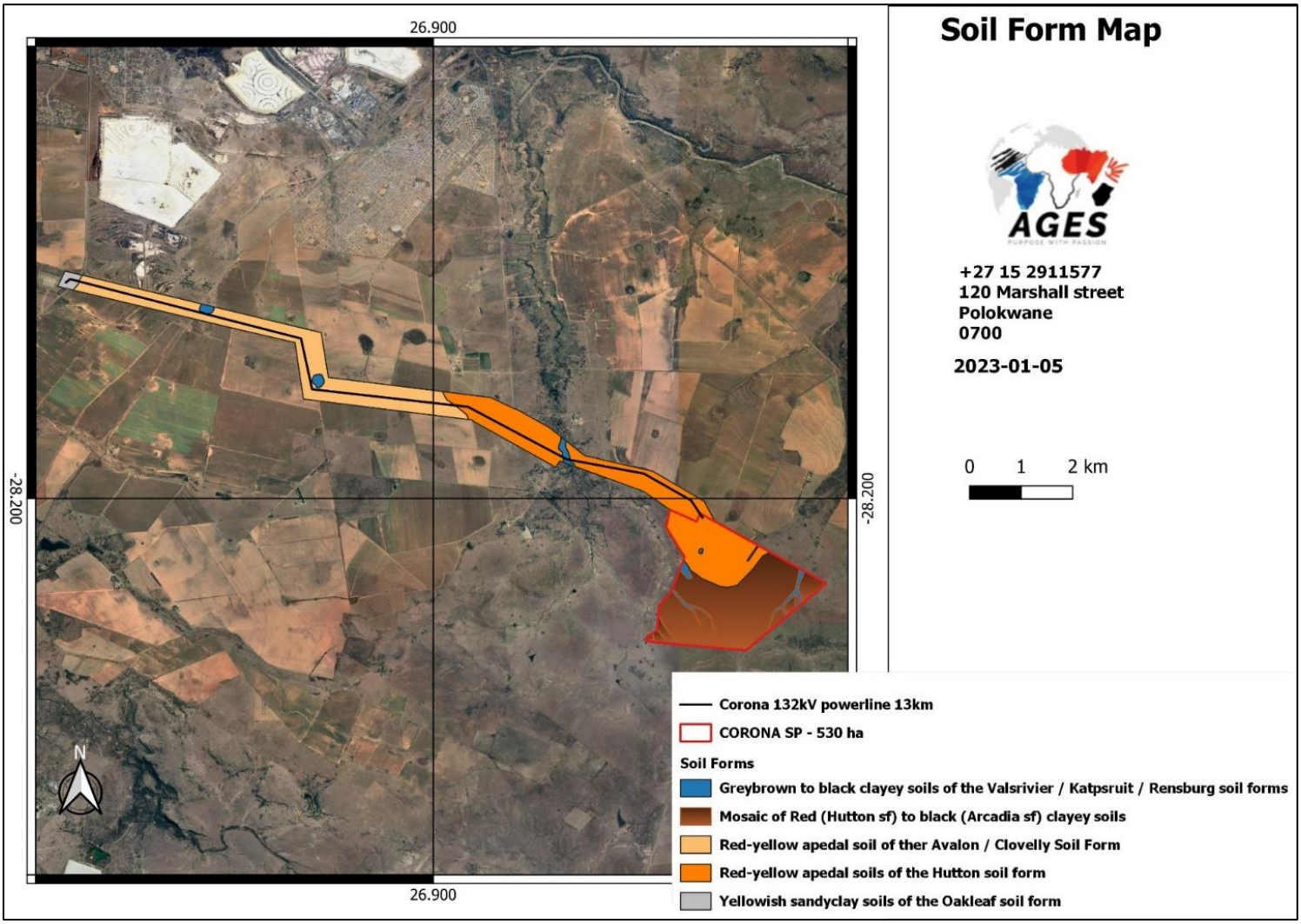


Figure 11. Soil Form Map

10.4.7 GEOTECHNICAL REPORT

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

10.4.7.1 Stratigraphy

- The site is underlain by recent aeolian sand calcrete, and Karoo sandstone deposits.
- No geosites have been identified on the site.
- No mining activities past or present are present on the property or will impact the property.
- Due to the climate shallow bedrock conditions is expected.
- Three soil profiles are expected on site:
  - Profile 1 - Transported aeolian sand overlying weathered sandstone
  - Profile 2 – Calcretized deposits close to the drainage features
  - Profile 3 – Weathered Karoo sandstone
- 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.
- 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.

There is no dolomite land in the vicinity of the project area. No potential for karstification and possibly stable.

10.4.8 ECOLOGY (FAUNA & FLORA)

A Terrestrial Biodiversity Impact Assessment (Annexure E) 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 pre-screening site visit was 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 riparian floodplains and 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. A survey was conducted during November 2022 to identify specific fauna habitats, and to compare these habitats with habitat preferences of different fauna groups (birds, mammals, reptiles, amphibians) occurring in the quarter degree grid. This report is included in Annexure E of the Draft EIA Report.

10.4.8.1 Vegetation types

The most recent classification 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 k*arroo 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, Gauteng Lesotho and Swaziland where it occurs along alluvial drainage lines and floodplains along rivers in the Grassland Biome. Vegetation in the Highveld Alluvial Vegetation is characterised by flat topography supporting riparian thickets 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. Only nearly 10% of vegetation type is statutorily conserved in Barberspan (Ramsar site), Faan Meintjies, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves. More than a quarter has been transformed for cultivation and dams (Bloemhof, Erfenis, Krugersdrif, Mockes and Vaalharts Dams). Highveld alluvia are prone to invasion by weeds, encouraged by high nutrient status of soils and ample water supply. Undergrowth of alluvial riparian thickets and the accompanying grasslands suffer from heavy overgrazing in many places (Mucina & Rutherford, 2006).

Proposed development site occurs on a landscape that varies from slightly undulating to flat plains bisected by drainage channels and wetlands. Important to survey the area to get an understanding of the ecosystem and potential impact of solar developments on natural environment was identified as a key factor, and subsequently footprint areas were surveyed. The site forms part of larger farm used for livestock farming and maize cultivation. Vegetation units on-site vary according to soil characteristics, topography, and land-use. Eight vegetation units were identified on development sites according to soil types and topography.

Vegetation communities identified on development site are classified as physiographic physiognomic units, (physiognomic refers to outer appearance of the vegetation, and physiographic refers to position of 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. Following vegetation units were identified during the survey.

- *Themeda – triandra – Setaria incrassatae* clay grassland.
- *Themeda triandra – Aristida congesta* secondary grassland.
- Open *Vachellia karroo* woodland.
- *Vachellia karroo – Searsia lancea – Euclea crispa* footslopes.
- Degraded grassland.
- Cultivated land.
- Exotic bushclumps.
- Old slimes dams
- Drainage features:
    - Valley bottom wetlands
    - River channels:
        - Floodplains rivers.
        - Non-perennial channels.
    - Exorheic depressions (dams).
    - Endorheic depressions (pans).

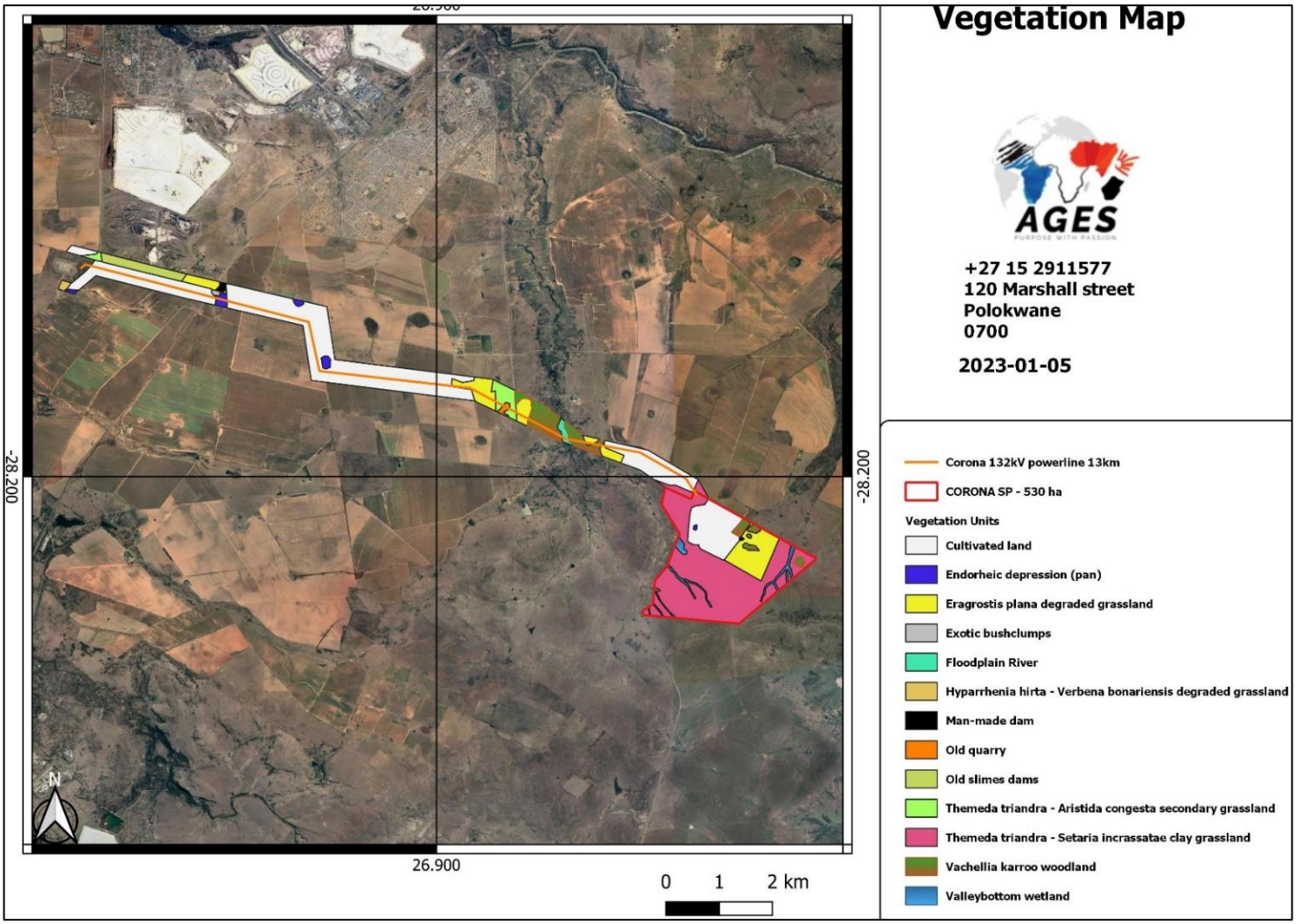


Figure 12. Vegetation Unit Map of the proposed development area (From Biodiversity report)

- *Themeda triandra – Setaria incrassatae* clay grassland

This grassland occurs throughout large sections of the project area. The grass layer is well developed and underlied by red apedal soils of the Hutton soil form and dark clayey soils of the Arcadia or Swartland Soil Forms. Grasses that dominate on the clayey soils are species such as *Setaria incrassatae* and *Themeda triandra*. The vegetation structure is tall, closed grassland. No red listed or protected species were documented in the area.

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 to the due to the widespread status through larger project area.
- The development of the solar development is considered suitable in this area.

- *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 being 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 (Photograph 5). Exotic weeds and pioneer grasses often colonize the areas surrounding the croplands. No detailed survey was considered for this area due to the completely modified state of the vegetation.

- **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 (Valley bottom wetland with channel, river channels & floodplains, 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 riverine woodland would be important dry season refuge areas for many fauna species in their natural state. It is also a centre of floral diversity. Riparian areas have been identified as important dry season refuge areas for a variety of large mammal species.

Impacts on the sensitive riparian ecosystems, regardless of the source, need to be restricted. Impacts on this system include erosion, habitat loss and degradation and the associated impacts on faunal and floral diversity, dewatering of marshes and wetlands, water abstraction as well as increased sedimentation. Continued impacts on the riverine ecosystems may also ultimately reduce the capacity of this system to absorb dramatic flooding events. The band of trees that occurs along the channel can be classified as riparian vegetation. This vegetation is very important for connectivity with adjacent vegetation as well as a migratory route for riparian animals. Paragraph 6.2.8 deals with Wetland & Riverine Delineation.

10.4.8.2 Red Data Species

No red listed plant species were recorded in the project area.

10.4.8.3 Protected Species (Free State Nature Conservation Ordinance)

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

Provincially protected species *Boophane distycha* and *Helichrysum nudifolium* were observed during the surveys. The species can be relocated from its current conditions if needed through a rescue and relocation programme should the development activities impact on populations.

10.4.8.4 Protected Trees Species (NFA)

The National Forest Act,1998 (Act No.84 of 1998) provides a list of tree species considered important in a South African perspective because on scarcity, high utilization, common value, *etc*. In terms of the National Forest Act, 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 a delegated authority. Obtaining relevant permits are required prior to any impact on these individuals. Considering data obtained from field surveys, **no protected tree species** occur in the area.

10.4.8.5 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 21. Declared weeds and invader plants of the study area.

Species	Category
Argemone ochroleuca	1b
Cestrum laevigatum	1b
Datura stramonium	1b
Eucalyptus camaldulensis	1b
Morus alba	3
Opuntia ficus-indica	1b
Opuntia imbricata	1b
Tamarisk chinensis	1b
Verbena brasiliensis	1b
Xanthium strumarium	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.

10.4.8.6 Ecological Sensitivity Map

Following the ecological surveys, the classification of the study area into different sensitivity classes and development zones was based on information collected at various levels on different environmental characteristics. 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.

Below is the sensitivity map for the proposed solar development, (Figure 5). Only criteria applicable to the specific vegetation units were used to determine the sensitivity of the specific unit.

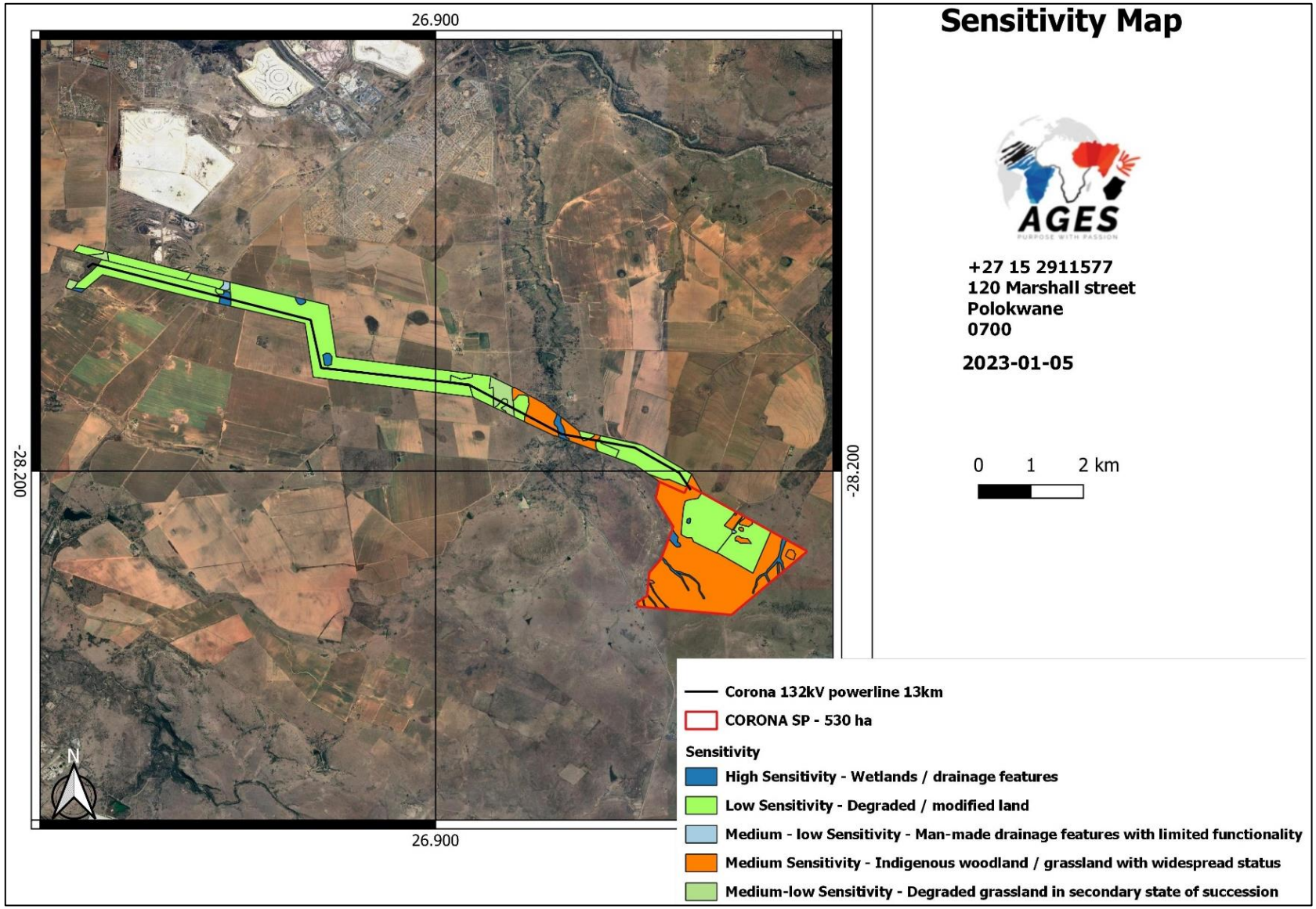


Figure 13. Sensitivity Map

10.4.8.7 Cumulative impacts

It is unclear whether other projects not related to renewable energy is or has been constructed in this area, and whether other projects are proposed. In general, development activity in the area is focused on agriculture and mining. It is quite possible that future solar farm development may take place within the general area.

According to the terrestrial biodiversity report, regionally landscape fragmentation could create barriers to the movement of species and their genes. The answer to the width and extent of corridors depends on the conservation goal and the focal species. Corridors for mammalian species are especially important for migratory species. For an African butterfly assemblage this is about 250m when the corridor is for movement as well as being a habitat source and a figure of 200m for dung beetles in tropical Australian forest was found. In the agricultural context, and at least for some common insects, even small corridors can play a valuable role. 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 are avoided by the proposed footprints so that steppingstone corridors (pans) and a network of linked corridors (active channels with riparian zones) remain. No habitats of threatened species that could easily be isolated (for example beetles with flightless females) are known to be impacted locally in the larger study area.

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 reprieve the pressures to use fossil fuels that are associated with numerous cumulative impacts and habitat losses.

10.4.8.8 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.

10.4.8.9 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.

Mammals

The Highveld Ecoregion contains a higher number of mammals, although only the orange mouse is restricted to the ecoregion, and the rough-haired golden mole 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, African civet, leopard, pangolin, honey badger, striped weasel, aardwolf, oribi, and mountain zebra.

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 sources of water.

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 wetland is an important habitat and dispersal corridor for moisture-reliant small mammals. The conservation of the wetland and buffer zone will conserve the moisture reliant African marsh rat (Near Threatened) on the study site and act as a movement corridor for small mammals..
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.

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, African rock-python, water monitor and veld monitor. There are also two strict endemic reptiles: giant girdled lizard, and *Agama distanti* (Branch 1998). Several additional reptile species are near-endemics, including Drakensberg rock gecko, giant spinytail lizard, and Breyer's whiptail (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, Variegate 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.

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

According to the existing databases and field survey the following number of fauna species included in the IUCN red data lists can potentially be found in the study area:

Table 22. 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

The negative impacts of the proposed development will have a medium to low impact on the 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 and woodland 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 outcrops, grassland and wetlands where little or no disturbances form 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 riparian habitat 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.

10.4.8.10 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 distribution of biodiversity, presence of threatened species and sites of scientific interest, that the proposed development has the potential for negative impact on 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 wetland areas to the south of the site should be avoided wherever possible during construction. Where unavoidable impacts will occur on grassland and wetland zones, strict mitigation measures and legislation should be implemented (DFFE licence for removal of protected trees, 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 completely modified to slightly degraded 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 microphyllous 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 wetlands (including valley bottoms and pans) and 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 (construction phase).

Mitigation measures are provided that would reduce these impacts from a higher to a lower significance. Furthermore, the proposed layout plan of the development should be consistent with the sensitivity map and recommendations stipulated in this report, and the impact on the sensitive habitats on site should be kept to a minimum.

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.

Cumulative impacts

Cumulative impacts on the ecology of the area can be significant. However, with the mitigation measures in place, the potential is low for significant negative impacts on the ecology of the area.

10.4.9 WETLAND & RIPARIAN DELINEATION AND AQUATIC BIODIVERSITY

Dr BJ Henning conducted a Wetland & Riparian delineation and Aquatic Biodiversity Report that is attached as Annexure G of this report.

Aerial photographs, digital satellite imagery, and provincial and national wetland databases were used to identify areas of interest at a desktop level. All possible measures were undertaken to ensure all freshwater ecosystems within the study and investigation areas were assessed. Site investigation of the study area was undertaken in November 2022, using visual assessment methods as well as digital satellite imagery. In addition, a bucket soil auger was

used to verify soil characteristics that may indicate the presence or lack thereof of any potential wetland/riparian features in the study area and associated investigation area.

The development site lies within the Grassland Biome which is found chiefly on the high central plateau of South Africa. Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. Trees are absent except in a few localised habitats. Geophytes are often abundant. Frost, fire, and grazing maintain the grass dominance and prevent the establishment of trees (Low & Rebelo, 1996).

Two wetland types were identified on the site for the proposed solar and power line development namely:

- Valley bottom wetland with channel
- Depressions:
  - 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.

The following are recommendations for the wetlands and rivers in the area:

- 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 Licence, except if outside the 1:100-year flood line or 100 meters from the delineated riverine areas or 500 meters from the wetlands.**

The wetland and riparian map and regulated areas for the wetlands and rivers are presented in Figure below.

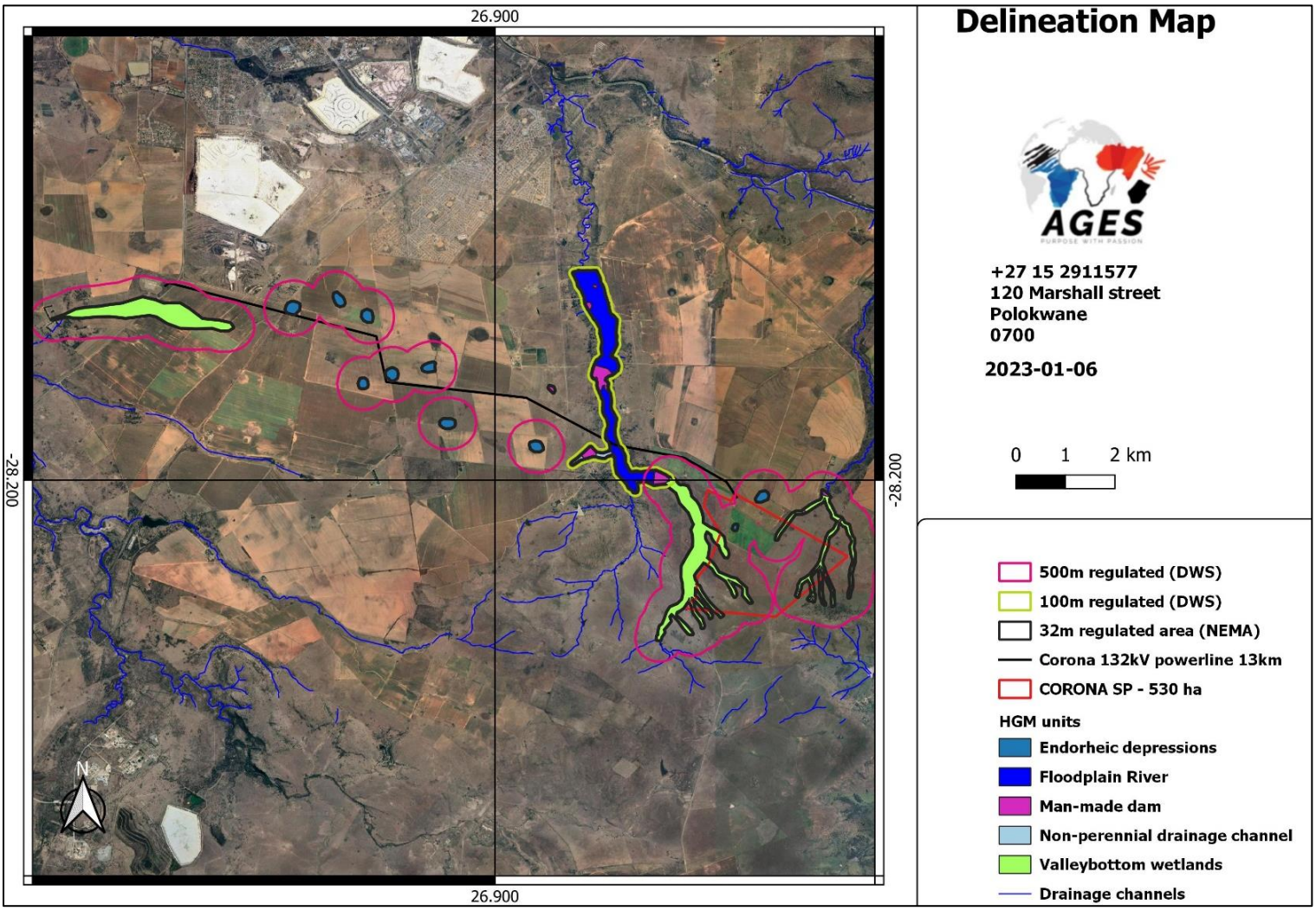


Figure 14. Riparian & Wetland Delineation map

10.4.10 AVIFAUNA

An Avifaunal Assessment (Annexure F) 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 proposed development does not fall in any IBA. The closest IBA is Willem Pretorius Game Reserve, 20 km away to the southeast.

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, Lanner Falcon and Secretarybird. No nests of SCC were observed.

Some high-risk avifauna species were recorded (14) from the project area and surrounding, including raptors and water birds with a risk of collisions, electrocution and habitat disruptions.

The main impacts of the operational phase of the proposed project are electrocution, collisions and habitat loss which will influence the avifauna species. 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 could also lead to sensory disturbance, poaching of birds/eggs, roadkill, chemical pollution and death or displacement of SCCs in the construction phase.

In the operational phase impacts could be habitat loss, collection of eggs /poaching, roadkill, collision with power infrastructure, electrocution risks, fencing and chemical pollution. Even though most of the 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**.

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 number of species expected and recorded is in a high-risk category for collisions and electrocutions.

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 24J of NEMA, Sept 2021). The mitigation hierarchy includes first avoiding the impact, minimising it, rehabilitation, and then offsetting. Where residual impact, even after mitigation, is high, then offsetting should 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 the FEIAR and EMPr as well as in Table 8-1 of the Avifauna Assessment.

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 prescribed

mitigation measures and monitoring must be considered by the issuing authority. Bird diverters, bird guards, and spirals must be placed along the proposed powerline to reduce fatalities, as large terrestrial birds and raptors occur across the proposed powerline and powerlines 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. In order to remove any duplication, only the areas that overlap with the remnant areas were considered. The total cumulative habitat loss was found to be 46.3%, a visual representation of this is shown in the following figure

Table 23. 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 %

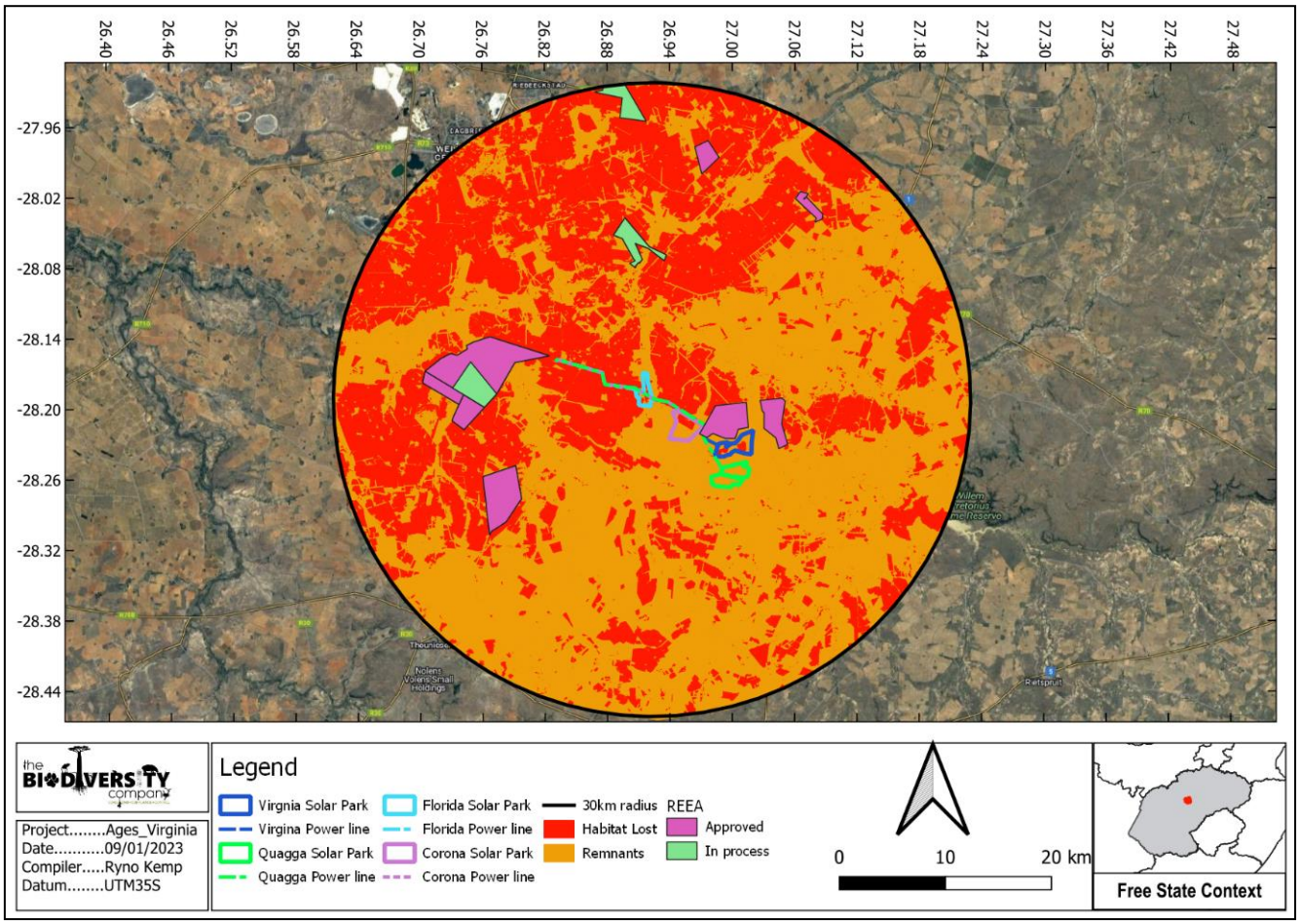


Figure 15. Cumulative habitat loss in the area

Monitoring Plan

Monitoring is to take place between September and February so that mitigation measures can be adapted to ensure the development does not have a long-term impact on the SCCs in the area. 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 data must be presented as described in Jenkins et al., 2017. **Error! Reference source not found.** of the Avifauna Report lists monitoring guidelines to be followed.

10.4.11 VISUAL

A Visual Impact Assessment (Annexure K) was conducted by Mitha Cilliers (independent visual Specialist) to determine visual impacts of the project. The visual impact assessment will analyse and rate impacts of the proposed project on the visual environment and a sense of place of the receiving landscape.

The main characteristics of the study area includes mining, crop and livestock farming giving the study area an agro-industrial sense of place. The area where the proposed solar parks are located is dominated by agriculture and in the north is buffered by the township of Meloding and the town of Virginia from the mining activities. The powerlines also become less further away to the southeast of the study area. Tourist attractions mostly occur on the outer edges of the study area, 20km radius, with the closets being the Allemanskraal Dam, approximately 16km southeast of the nearest solar park site, on the outer edge of the visual analysis. Guest houses mostly serves the mining community. The residential component of the study area includes farmstead with associated workers housing as well as the towns of Virginia and Ventersburg and the townships of Meloding and Mmamahabane. Night-time character would mostly be characterised by lights associated by the farmsteads and a larger glow in the northern section associated with the township of Meloding, town of Virginia as well as the mines.

Travellers would include a combination of business, local residential, tourist travellers as well as passers-by travelling through the study area to other destinations. Business receptors would range from industrial to tourist receptors. Open spaces receptors would mainly include grazing and open fields.

In the light of the mixed agro-industrial sense of place and the other characteristics of the receiving environment, the proposed project components will exhibit a *medium contrast* with the receiving environment. *No night-light impact* is anticipated. Discussions with the aviation impact consultant revealed that it is *unlikely that glint and glare from the proposed project would interfere with the Approach / Departure flight paths* for the three local airports that are located approximately 20km – 40km from the proposed project.

The visual analysis was run on a digital elevation model with interpolated 5m contours. This means that the screening effect of smaller nuances in the topography as well as the existing vegetation might not be reflected in the result of the analysis. The result from the analysis therefore indicates the worst-case scenario of the visual impact. Often, existing vegetation around Visual Sensitive Receptors (VSRs), especially residential VSRs, screen views of a project at least partially if not wholly. The VSR Identification Table below, captures and rates identified VSRs within the whole study area.

Table 24. VSR Identification Table

Label	Description	Rating
Residential		
R01	Farmsteads with associated residences and outbuildings	***high***
R02	Towns & townships	***high***
R03	Agricultural holdings / clusters of residences / other small communities	***high***
Transport		
T01	N1 national road	***high***
T02	Regional roads	*medium*
T03	Other roads	*medium*
T04	Railway	*low*
Business/Occupational/Industrial		
B01	Tourist attractions / events locations	***high***
B02	Adamsonvlei Primary School	*medium*
B03	Agricultural silos	*low*
B04	Business agricultural / industrial	*low*
B05	Mining	*low*
Open Space Users/Recreational		
O1	Agriculture / grazing	*low*
O2	Historical landmark – Sandrivier Convention Memorial Stone	***high***
O4	Nature and Game Reserves	*medium*

The Table above can be summarised as follows:

- all **Residential** VSRs (R) were rated with a ***high*** sensitivity,
- all Transport VSRs (T) with a *medium* sensitivity, except for the **N1 national road** has a ***high*** sensitivity and the railway line a *low* sensitivity
- all Business / Occupational / Industrial VSRs (B) were rated as *low*, except for tourist attractions / events locations that were rated ***high*** and the Adamson Vlei Primary School that was rated *medium*,
- Open Space Users / Recreational VSRs (O) included agricultural fields, grazing and all other open areas. These were rated *low*. The Sandrivier Convention Memorial Stone historical landmark was rated ***high*** and the nature / game reserve areas as *medium.*

For ease of reference, the locations of the *VSR*s were indicated on all the analysis maps.

VSRs with the largest anticipated impact included the residence on the farm Le Roux No. 776 which was rated as *substantial*. This rating is a result of their proximity to the proposed powerline and the portion of the solar park components that would possibly be visible to the viewer.

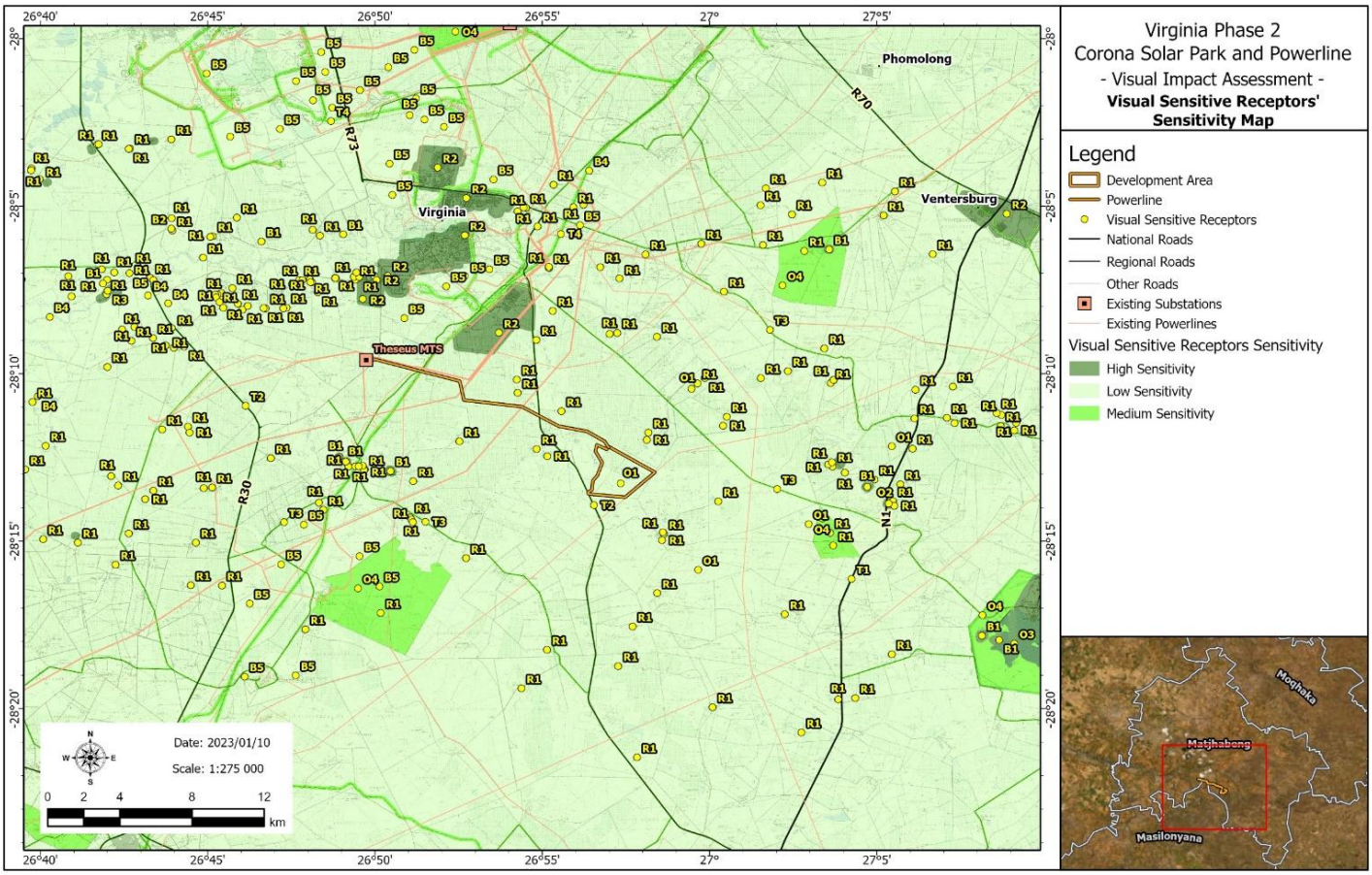


Figure 16. Localities of Visual Sensitive Receptors (VSRs)

The **visual characteristics** (form, shape, colour, texture) of the proposed project would be a dark black-blue band when viewing the PV side of the panels, and a galvanised metal for the rest of the frame and the back. New frames of zinc steel or aluminium would be bright at first, but after 3 months they would become oxidized and duller.

These colours would appear as a narrow band or planes in the horizontal plane. As one moves further away from the project the individual characteristics of the panel would fade into a fine texture and eventually into a single block.

During overcast skies PV panels often pick up on the white of the clouds above, appearing lighter in colour and contrasting in the scene a bit more than the usual black-blue band which is more recessive and less obvious. This effect should not be confused with possible glare reflected off the shiny surface at critical times and angles. The PV panels are designed to absorb as much sunlight as possible and are therefore covered in high transmission tempered glass with anti-reflective (AR) coating limiting the reflected light to less than 2%.

The workshops & warehouses, Battery Energy Storage Systems as well as the pre-fabricated buildings during construction, will introduce a solid, rectangular blocks of colour as well as strong angular and vertical lines.

In terms of night-time impact, it is assumed that, as with most solar park developments, this project will make use of a video-surveillance system. These systems use infra-red or micro-wave video-cameras, which do not need a lighting system. Only small internal streetlamps will then be lit during the operational phase of this project. It is assumed that both construction and decommissioning activities would be restricted to daylight hours. Security lighting will only be activated during illegal intrusion to the property.

The **Zone of Visual Influence** (ZVI) for the solar panels is quite contained despite the openness of the topography and lack in taller vegetation. Ridgelines contains the ZVI to the eastern half of the Zone of Potential Visual Influence (ZPVI). Drainage channels bisecting the study area cuts into the ZVI from the west and southeast. The ZVI for the solar panels covers 22% of the ZPVI for this specific project, a 16km radius around the project components. The ZVI for the powerline is quite expansive and, almost wholly, includes the ZVI of the solar panels except for a few portions on its eastern edge. The Klipspruit, Maselspruit, Schoemanspruit and Doringspruit drainage lines cut in from the south and east. The ZVI for the powerline covers approximately 59% of the ZPVI area. The combined ZVI for the solar panels and the powerline combined covers approximately 55 % of the total ZPVI area for this project.

The visual analysis is done based on an elevation model and does not take the screening effect of the existing vegetation and current built structures into account. To include this screening effect, the *Wholeness* rating was adjusted to a lower level before the *Magnitude* was determined. Due to the powerline being placed inside and existing powerline corridor, the proposed powerline exhibited a *low contrast* with the receiving landscape.

The result from the Visual Assessment Analysis can be summarised as follows:

- The generalised ***Relevance*** for all **Residential VSRs (R)** was ***marginal***
  The average *Sensitivity* was *high,* and the average *Magnitude* was *small*
- The generalised ***Relevance*** for all **Transport VSRs (T)** was ***marginal***
  The average *Sensitivity* was *medium,* and the average *Magnitude* was *small*
- The generalised ***Relevance*** for all **Business VSRs (B)** was ***marginal***
  The average *Sensitivity* was *low,* and the average *Magnitude* was *small*
- The generalised ***Relevance*** for all **Open Space Users/Recreational VSRs (O)** was ***marginal***
  The average *Sensitivity* was *medium,* and the average *Magnitude* was *small*

Impacts to views are the highest when viewers are identified as being sensitive to change in the landscape, and their views are focused on and dominated by the change. The relevance consisting of the sensitivity and the magnitude will be determined to find the visual impact of the development on the receptors in the area. According to the visual specialist the vanishing threshold for the magnitude has been established at 8km away. This is the distance where no discernible impact is observed, even if the proposal is technically still visible.

The **Cumulative Impact** can be described as follows.
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 powerlines consisting of a range of pylon sizes. These are however, mostly located north of the proposed solar park developments. The powerlines 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 powerlines. Each of the proposed powerlines would contribute cumulatively to the effect of the existing powerlines within the context of the receiving environment. The proposed pylons are however smaller than the pylons of the existing powerlines. The proposed powerline length has been amended. It is shorter now and only runs for 7 km up to the proposed Florida substation. The anticipated effect of the pwerline is thus less than what was originally planned.

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 powerline would add **cumulatively** to the visual clutter of the existing *powerlines* within the study area. Should all four the proposed developments be implemented, the impact from the powerline would increase incrementally just over 5% more than the impact from the Corona solar park individually. Currently there are no *solar parks* within the study area. The proposed solar park would however add cumulatively to the existing mining / industrial character type of the overall sense of place. The cumulative impact would be just over 5% more than the impact from the Corona solar park individually. In terms of the powerline and solar park *combined*, the cumulative impact is approximately 3% more than that of the proposed Corona project. 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 22% of the ZPVI. Cumulatively, the combined 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 a third of the cumulative ZVI for the solar parks combined.

The combined ZVI for the powerline and solar park would be approximately 55% of the ZPVI. The cumulative impact of all four projects is anticipated to be 58% of the ZPVI. The cumulative impact would be incrementally larger than the individual ZVI.

The significance table of visual impacts are given below.

Table 25. EIA Significance Table

Phase	Mitigation	Residential VSRs	Transport VSRs	Business / Occupational / Industrial VSRs	Open Space Users / Recreational VSRs
Construction	without	medium	medium	medium	medium
	with	medium	medium	medium	medium
Operational	without	medium	medium	medium	medium
	with	medium	medium	medium	medium
Decommissioning	without	medium	medium	medium	medium
	with	low-medium	low-medium	low-medium	low-medium

Proposed **mitigation measures** did not have a significant effect on the *duration, extent, frequency, probability* and *compliance* of the visual impacts, rather it would add to good practice found in an Environmental Management Programme. Clustering the proposed developments is proposed measure to reduce the impact on the study area.

From the visual impact analysis and the tables above, it is clear that the implementation of the proposed Corona 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***. 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.

At closure, after rehabilitation of the site, the impact will reduce to insignificant, as the site will be rehabilitated, and structures and infrastructure removed.

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.

10.4.12 SOCIO-ECONOMIC ENVIRONMENT

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

10.4.12.1 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 150 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.

10.4.13 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 R4.8bn will be required (240 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 CO_2 Emissions per Unit of Electricity Generated**

  CO_2 emissions for 240 MW of solar energy will be reduced relative to coal fired power generation, which is the current national standard. The quantity of CO_2 potentially avoided by this project will be approximately 600,000 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. The economic impact of the proposed project will therefore be positive with a low to moderate significance. The positive impact will increase with the concentration or clustering of new projects in a particular 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 as approved under bid window 5.

- Job Creation and Skills Development

  Permanent job creation on the proposed project could be 40 people. More jobs will emerge within the value chain for the 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. Although this commitment has not yet been formalised, it could and should be structured in a way that will contribute meaningfully to the quality of life of a local community who could be identified, probably in Ventersburg and Virginia, and engaged in consultation with the local municipality. The impact is positive with a low significance in terms of the 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.

10.4.13.1 Conclusion on Socio-Economic Assessment

The socio-economic impact of the proposed Corona 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.

10.4.14 AGRICULTURAL POTENTIAL

An Agricultural Potential Impact Assessment on soils potential was conducted and is included in this Report in Annexure L. 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 also 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 the 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.

After a thorough investigation of an aerial photograph of the area and visual assessment of the specific sites and areas surrounding the sites, the following was done:

- Field observations were randomly made in the accessible, with specific emphasis on the resource area.
- Since the soils do qualify as high or very high sensitivity soils from an Agricultural Resources point of view according to the Screening Tool, a detailed assessment was conducted on soil physical characteristics to verify potential of the soils at small-scale.
- Slopes were analysed to determine the viability to cultivate crops in specific areas.
- The following soil physical and chemical characteristics were analysed through physical investigation:
    - Soil Depth (soil auger used).
    - Soil clay content (land type memoirs).
    - Soil texture and general structure.

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.

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

- Vertic clay soils of the Hutton (red clay) or Arcadia (black clay) soil form
- 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.
- 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.

SOIL TYPES	Description	Landscape	Depth (MM)	Texture	Ave Clay Content	Agricultural Potential	Land capability
Vertic clay soils of the Hutton (red clay) or Arcadia (black clay) soil form	Arcadia soils are characterised by a vertic A-horizon. The Vertic horizon is strong developed structure with clearly visible, regularly occurring slicken sides in some part of the horizon or in the transition to an underlying layer. The soils occur in the southern and central section of the project area and the most of these areas are currently used for livestock grazing. The red clay soils are of the Hutton soil form and has an apedal structure. Hutton soils are identified based on presence of a structureless "red" B-horizon. These soils are the main agricultural soil found in SA, due to deep, well-drained nature of these soils. The Hutton soil form on site is deep, although it has a high clay content in combination with the Arcadia soil form	Slightly undulating plains	200-500	Clay	25-40 %	Medium potential arable soils, due to the depth and clay content being suitable for crop cultivation. Limiting factor is not soil characteristics, but prevailing climatic conditions.	Grazing potential of these areas is medium to high. Most suitable and optimal utilization of the area would be grazing by livestock or wildlife. Soils are susceptible to erosion and over-grazing is a distinct and widespread risk.
Red-yellow apedal soils of the Hutton soil forms.	Hutton soils are identified based on the presence of a structureless "red" B-horizon. These soils are the main agricultural soil found in SA, due to deep, well-drained nature of the soils. Hutton soils found on site are restricted to north-eastern and north-western plateaus of the site. Hutton soil form on site is deep but has a low clay content. Relatively high magnesium and iron content of parent rocks from which the soils are derived, impart strong red colours as seen on site.	Slightly undulating landscape	600-1200	Fine sandy to sandy loam	6-25%	Moderate potential soils– deep and loamy that has good water holding capacity and clay content of soils sufficient. Under climatic conditions soils would not sustain arable crop production. Most viable option for crop production is under irrigation. Irrigation is not a common practice and for as it will require water impoundments (storage during dry months). Limited water availability, high evaporation rates and high water demand by crops would render crop cultivation not sustainable. Many old, cultivated fields confirm that crop cultivation in long term is not financially viable option under prevailing climatic conditions.	Livestock and / or game grazing are viable due to the slightly higher nutrient and organic content of the topsoil in grassland and woodland areas that support a mixture of palatable and unpalatable species.
Red-yellow apedal soils of the Avalon/Clovelly soil form.	Yellow-brown apedal horizon is same as Clovelly soil form and a plinthic horizon. Clovelly soils is identified as an apedal "yellow" B-horizon. Hutton soils are main agricultural soil found in SA, due to deep, well drained nature of soils. Clovelly soils occur as mosaic with Avalon soil forms in central section of the power line route. Clovelly soil form is deep and has very low clay content. Compaction and erosion are physical hazards to be aware of and catered for with these soil types.	Plains	800-1 200	Sandy-loam-clay	6-20%	Moderate to low potential soils, due proximity to wetlands and erodibility of soils.	Grazing potential of low-lying areas is high due to palatable grasses growing through the year on soils. Soils are sensitive and prone to erosion. 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.	Oakleaf soil consists of an orthic A horizon, overlying a neo-cutanic 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.	Slightly undulating plains	600-1 200	Fine sandy-loam soils	8-15%	Moderate potential soils– deep and loamy that has good water holding capacity and clay content of soils sufficient. Under climatic conditions soils would not sustain arable crop production. Most viable option for crop production is under irrigation. Irrigation is not a common practice and for as it will require water impoundments (storage during dry months). Limited water availability, high evaporation rates and high water demand by crops would render crop cultivation not sustainable. Many old, cultivated fields confirm crop cultivation in long term is not financially viable under prevailing climatic conditions.	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.
Greybrown clayey soils of Valsrivier/ Katspruit/ Rensburg soil forms	The Rensburg Soil Form is also characterised by the occurrence of a vertic A horizon, with the A-horison underlain by a G-horizon	Drainage channels and wetlands	700-1000	Clay	40-60%	Zero potential soils, due to the soil wetness these areas are not suitable for crop cultivation under arable conditions.	Grazing potential of low-lying areas is high due to palatable grasses growing through year on soils. Only limiting factor may be livestock movement is limited during wet season when clay expands, causing livestock to get stuck in muddy conditions. Soils are very sensitive and prone to erosion. Specific strategy is needed to prevent damage to soils considering overgrazing and trampling has already caused some degradation of floodplains.

10.4.14.1 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 26. 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 Corona Solar Park and associated power line, located in the Free State Province can be classified as having Moderate potential soils because of the following:

- Development site is composed of clayey to sandy to sandy-loam soils. The soil has a clay content varying from 4% (sandy soils) to 30% (clayey soils). Soils are predominantly red yellow apedal soils with a loamy texture on the plateaus in north-western and north-eastern section, and southern section of site is dominated by black clayey soils.
- The farm is expected to receive an annual rainfall of ± 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, restricted to irrigated cropping due a high risk that could be associated with dry-land farming. At present no irrigation or centre pivots occur on the property. Higher day temperatures and evaporation rates in summer months may hamper soil moisture storage for crop use.

- 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. The cultivated land was largely not considered for the development outside the limits of the compliance guidelines, and therefore only 0.25ha of cultivated and will be developed per 1 MW of land used for the solar plants. Therefore, 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.

Results were obtained from the study to verify soil potential as classified by the Department of Agriculture on a small scale. The site should be considered to have moderate potential grazing land with Moderate potential for arable agriculture considering climatic conditions, soil physical characteristics and size of land potentially available.

Grazing land (Livestock production)

Current vegetation at proposed development site consists mainly of areas of with mixed quality grazing (palatable and unpalatable grasses) throughout most parts of the site and these areas can support limited grazing by livestock and game species. Nature of the vegetation and size of the property 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 panels as mounting systems are at least 1m above ground level, the grazing value of the land will be available to small livestock (game and sheep). At the end of the lifetime of the solar plant, structures will be removed, and natural vegetation will re-establish naturally. Grazing value of the land can be increased by using planted pasture underneath the solar panels. The nature of the vegetation at the farm is marginal for extensive livestock production. Using planted pasture to supplement livestock production is possible but this could be constrained by high demand for irrigation water due to the shallow and sandy nature of the soil and relatively high day temperatures in summer.

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

10.4.14.2 Impacts on the agricultural capability

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 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.

10.4.15 CULTURAL AND HERITAGE RESOURCES

An Archaeological Impact Assessment (Annexure H) 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 number of heritage resources were identified during the site survey and the following observations were made:

- Two Historical Period settlements or potential settlements (CRS-HP01, CRS-HP02) occurs within the proposed Corona Solar Park Project and the powerline corridor and impact on the sites is likely. However, little remains of the potential settlements in terms of heritage features and material culture and the sites are rated as low significance. Monitoring throughout all phases of the project will be required in order to avoid the potential destruction of undetected heritage sites.
- It is recommended that the EIA public participation and social consultative process address the possibility of human burial sites occurring in the project area.
- 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 Corona 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 the course of 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.

Table 27. Corona Solar Park Project Heritage sites

Site Code	Coordinate S E	Short Description	Field Rating	Mitigation Action	Project Phase
CRS-HP-01	S28.224203° E26.944721°	Historical Period Site	2a. Medium Low Significance	General Site Monitoring in order to detect the presence of and limit impact on previously undocumented heritage receptors during construction / site clearing / earth moving.	Construction Operations Decommissioning
CRS-HP-02	S28.185712° E26.912904°				

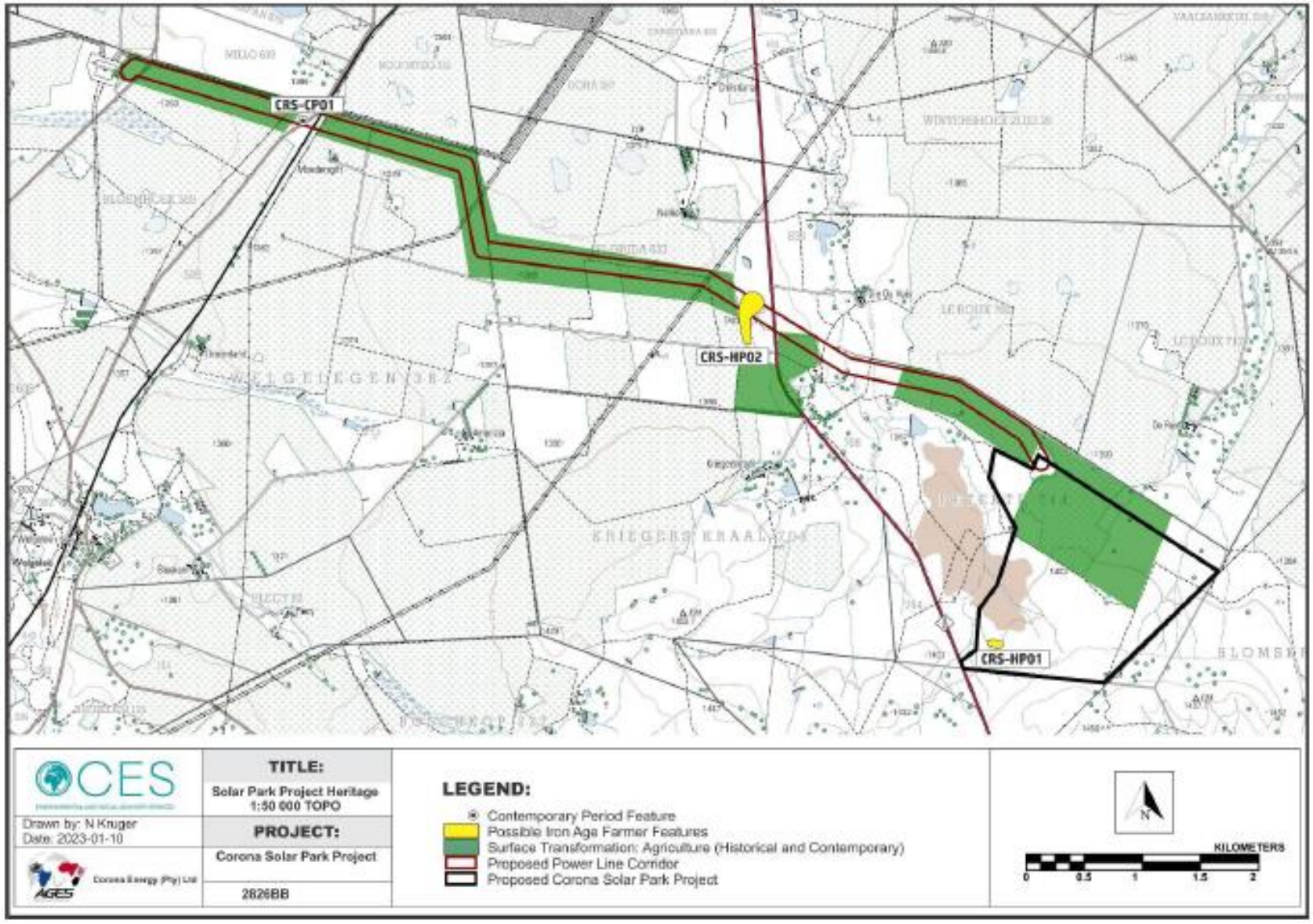


Figure 17. Topographical map indicating the location of heritage occurrences and landscape features located within the Corona Solar Park and power line Project area.

10.4.16 PALAEONTOLOGICAL RESOURCES

A Palaeontological Impact Assessment (Annexure I.2) was conducted by Prof Marion Bamford of WITS University

10.4.16.1 Recommendations of the Palaeontological Specialist

According to the Palaeontological Impact report there are no rocky outcrops and NO FOSSILS present on the land surface on the **Solar PV site**. Given a 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 must be added to the EMPr. Based on the information it is recommended that no further palaeontological impact assessment is required unless fossils are found by 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 palaeontology is concerned, the project should be authorised.

10.4.17 TRAFFIC IMPACT ASSESSMENT

FINDINGS OF THE TRAFFIC ASSESSMENT

Owing to the type and nature of the proposed activities as part of the Proposed Solar Parks, (Florida, Corona and Quagga) it is expected that the Proposed Solar Parks individually and cumulatively will have a manageable impact on vehicle traffic during all phases, provided that the road infrastructure improvements are implemented as indicated in the **Traffic Impact Report** to mitigate the potential impact of the Proposed Solar Parks.

- Vehicle access to and from the Proposed Solar Park is planned to be gained from and to Road R73. Suitability of an access point is based on intersection stopping and decision sight distance requirements guided by the *Committee of Transport Official TMH 16 Volume 2 South African Traffic Impact and Site Traffic Assessment Standards and Requirements Guideline Version 1.01 February 2014*, as well as from road geometry, intersection spacing, and Proposed layout perspective. (Figure 16 below)
- Due to the proposed Solar Park, no additional road infrastructure is required from a traffic capacity point of view other than construction of proposed access intersection.
- The proposed access intersections of the Proposed Florida, Corona and Quagga Solar Parks will operate at acceptable levels of services for the relevant time frame regardless of whether one facility is constructed and operated, or all facilities are contracted and operated at the same time.
- The road network-related impact from road capacity perspective due to the proposed Solar Park would have a low significance due to a low volume of vehicles along Road R73 and no road capacity-related mitigating measures would be required. Reserve capacity is available at relevant proposed intersection on existing road network.
- Road network-related impact from a road safety perspective in terms of intersection spacing would have a low significance due to rural locality of Corona Solar Park and no road safety-related mitigating measures in terms of intersection spacing is required.

- The road network-related impact from a road safety perspective in terms of intersection sight distances due to the Proposed Corona Solar Park access intersections (Point D) would have a low significance due to the required intersection sight distances being sufficient at the proposed access intersection 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 Corona solar Park and no road safety-related mitigating measures in terms of the speed limit would be required.
- The relevant section of Road R73 under investigation currently has a very low sensitivity in terms of the factors used for assessment and would remain very low with the Proposed Solar Parks.
- 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 Corona Solar Park access intersection (Point D) would have a medium-high significance. Dedicated left-turn lane on the northern approach of Road R73 recommended to allow safe space for vehicles turning left to reduce speed for turning and allowing through traffic to continue at normal speed. With the provision of the above-mentioned at the proposed access intersection (Point D), 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 intersection (Point D) due to the Proposed Corona Solar Park would have a low significance as no pedestrian activity is expected along Road R73 due to the rural locality of the Proposed Corona Solar Park and limited public transport availability, and 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 Corona 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 Corona 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 Corona 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.

It was concluded that the road network-related impact during the construction and operational phases for activities as part of the Proposed Solar Parks **(cumulatively) will be the same as for the construction and operational phases of Florida, Corona, and Quagga Solar Parks individually.**

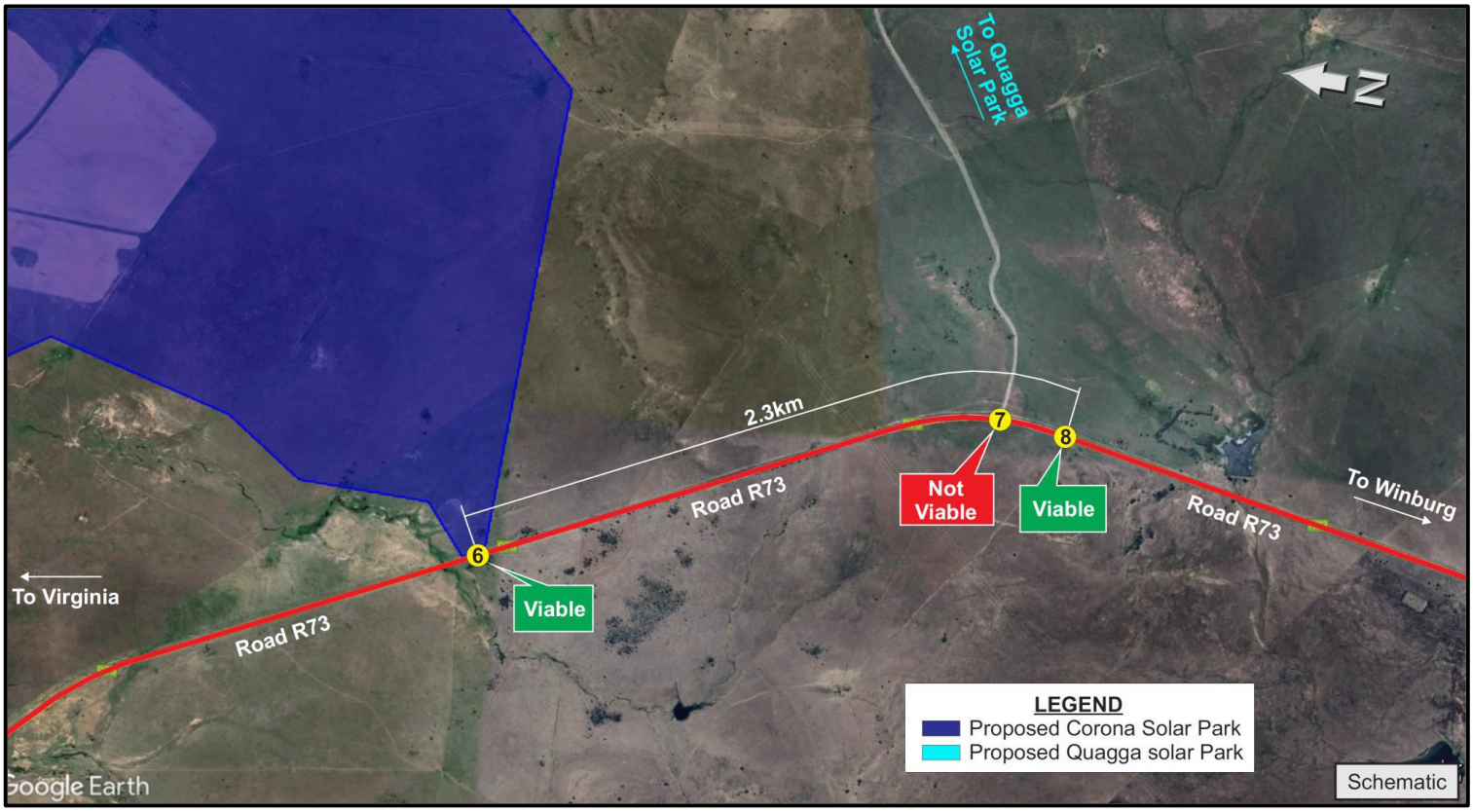


Figure 18. Graphical representation of potential access point from and to Road R73 for Corona Solar Park (No 6).

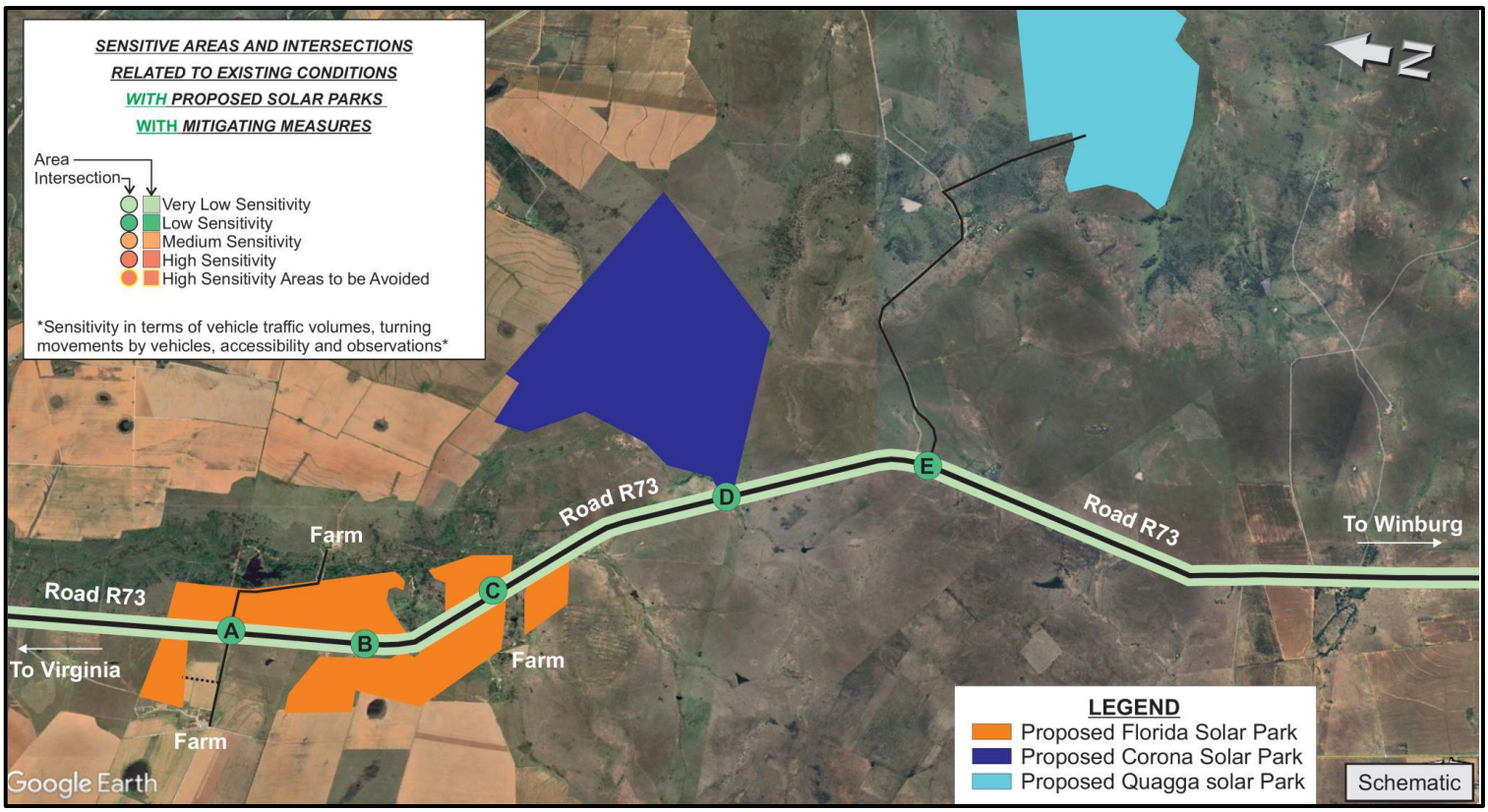
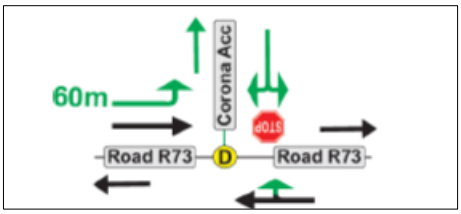


Figure 19. Graphical representation of sensitive road sections indicating anticipated sensitive areas and intersections with the proposed solar parks (Florida, Corona & Quagga) (With mitigating measures) Corona Solar Park is at Access D.

RECOMMENDATIONS FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

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

- Provide 60 metres dedicated left-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 at site access.



- No public transport is available in the area. Transport for workers should be by means of arranged or contracted transport. A dedicated public transport loading and off-loading area should be provided on site where workers and visitors can be loaded and off-loaded within a safe and dedicated area.
- Approval for the positions and geometric layouts for the proposed access intersections and relocation of existing intersections 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.
- **The same recommendations would apply if all three solar parks namely Florida, Corona & Quagga would be constructed at the same time.**

REASONED TRAFFIC ENGINEER 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 Development would have a manageable impact on the relevant road network during all phases and regardless of whether only one facility is constructed and operational or all facilities are constructed and operational at the same time, as long as the mitigation measures are implemented as recommended in the Traffic Impact Report. In this case, it is therefore recommended that authorisation be granted.

This opinion is also valid for the simultaneous construction of Florida, Corona and Quagga Solar Parks.

The Traffic Impact Assessment Report is included in Annexure R.

10.4.18 RADIO FREQUENCY INTERFERENCE (RFI) ASSESSMENT

The RFI Assessment (Annexure N) 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.

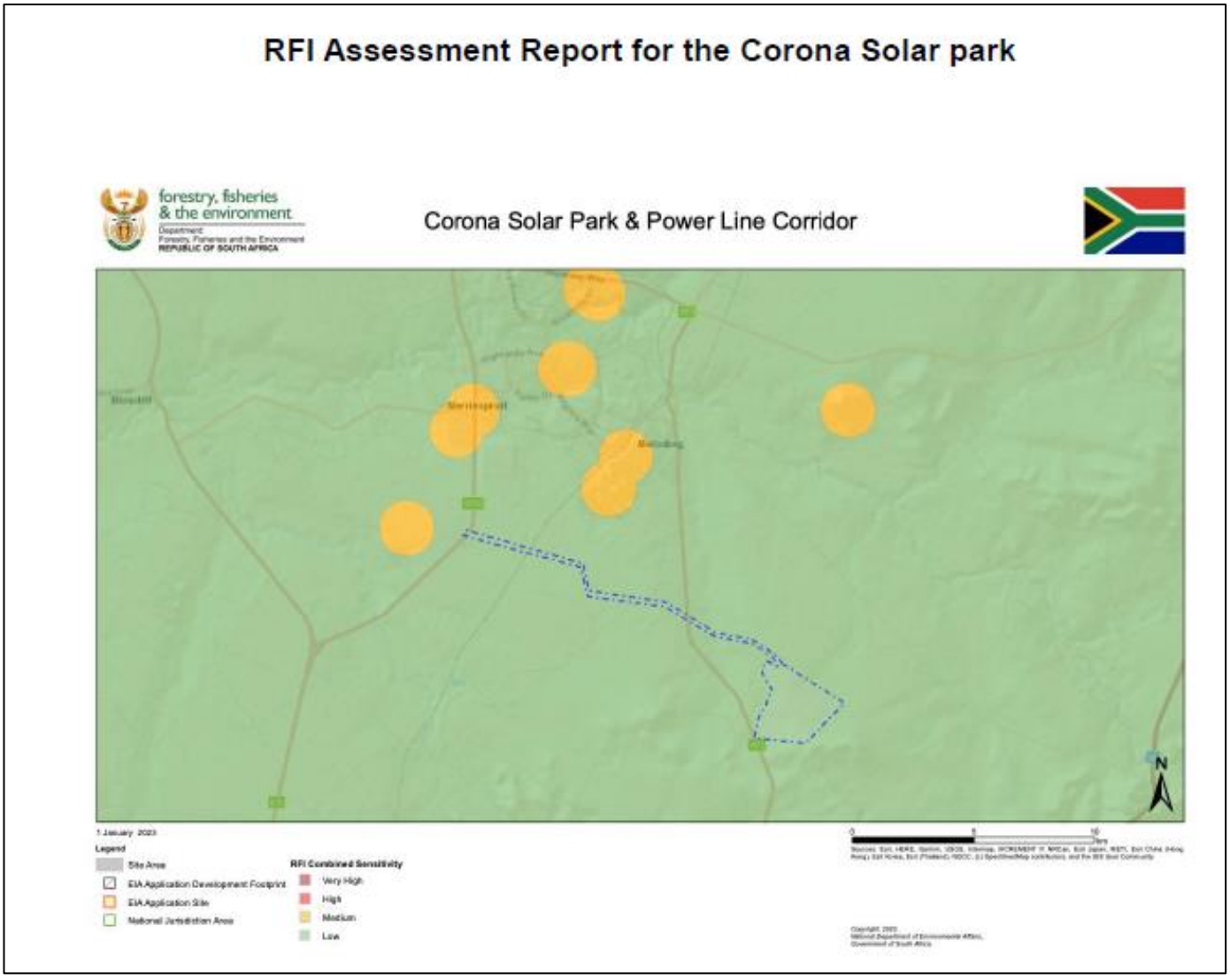


Figure 20. RFI Sensitivity screening of Solar Park and Power line corridor

10.4.19 AVIATION IMPACT REPORT

An Aviation Assessment (Annexure M) was conducted by Mr T du Toit of TAC (Pty) Ltd.

The specialist verified that the Corona 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 Corona Project's location is outside the Harmony Mine and Beatrix Mine Airport's Approach and Departure surfaces. From figure 16 it can be verified that the Corona Project will NOT interfere and will NOT have an impact on Harmony Mine Airport's Obstacle Limitation surfaces. This is because the Corona Project is located outside Harmony Mine and Beatrix Mine Airport's Approach and Departure surfaces.

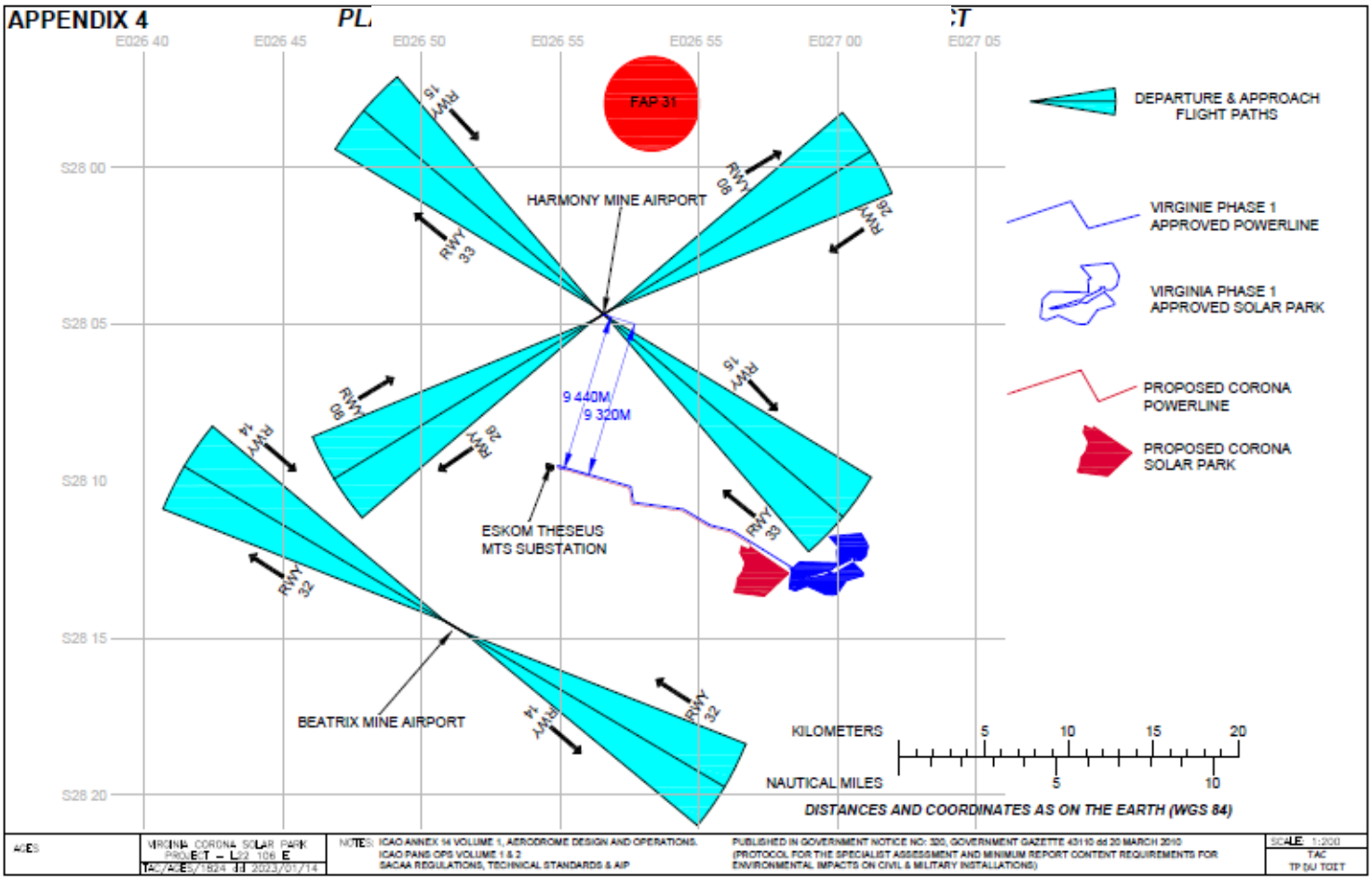


Figure 21. Flight paths for Corona project

10.4.20 STORMWATER MANAGEMENT

Storm water management measures must be implemented during the construction and operation phases of the project. These measures must ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water of increase soil erosion. Appropriate design measures must be implemented to allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.

Diligence in stormwater management is essential and a full-time task, even during dry periods, as the lack of it may lead to slow degrading of the site, rendering it susceptible to serious damage in the event of unexpected flooding, and subsequent potential damage to equipment on site due to gradual erosion after normal rainfall events.

Construction Phase Storm Water Management

- It is recommended that access and service roads, as well as stormwater systems are constructed at the commencement of the construction phase to ensure that suitable stormwater management measures are in place at the least additional cost.
- In order to preserve the natural state of the surface and vegetation as far as practically possible, off-road driving should be restricted to the absolute essential.
- Temporary or permanent soil stockpiles should be placed in such a way to minimize the impact on surface flow.
- Site clearing should be limited to the essential.
- Construction waste, including possible broken and damaged panels must be collected and stored safely for disposal in accordance with the relevant waste regulations, protocols, and product specifications. Care must be taken not to leave any waste on site that can lead to future contamination of the site or the downstream area.
- Training with regards to stormwater management of construction personnel must be undertaken as part of their induction.

Operational Phase Storm Water Management

- Training with regards to stormwater management of site personnel must be undertaken as part of their induction. Refreshment training must be undertaken periodically.
- Regular conditional inspections of all storm water infrastructure are required.
- Any item that may be found to be out of order, for instance accumulation of settled sand in a trench, or erosion, must be addressed and corrected without delay to keep the storm water system in a good and fully functional condition.
- Specific attention must be given to inspection during and after any rain and/or flood event to kerb any damage that may occur.
- If any structures have to be erected in a 1:100-year flood line zone, Water Use Licencing is compulsory (in terms of section 21(c)) of the National Water Act.

10.5 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 environmental impacts identified will be quantified and significance of impacts will be assessed. Each impact will be assessed and rated. The assessment of the data, whereas 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. Construction activities for the establishment of the proposed PV power plant will 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;
- construction of the on-site high-voltage substation and one 33 kV power line, for the connection to the on-site substation of the Corona Solar Park.

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 will be included in the EIA report.

DURATION

Impact of construction activities will only be for the duration of construction phase, after which it will cease completely. (Construction period planned to last between up to 24 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. The evaluation of environmental impacts will be discussed in detail in the EIA report. Environmental impacts associated with the operational phase of a solar energy facility may include visual and other impacts. Decommissioning activities of the PV plant mainly include removal of 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 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; and
- Visual impacts.

Potential impacts may 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: Unknown
  - Significance: Unknown
- 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 to Low-Medium
- Radio Frequency Interference
  - Extent: Locally at the proposed site
  - Duration: Life of the project (approx. 30 years)
  - Probability: Very Low
  - Significance: None

The significance of the potential impacts was determined as all the specialist studies have been obtained.

10.5.1 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. 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.

10.5.2 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.

10.5.3 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.

10.6 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 battery;
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

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.
- BESS must have an online condition monitoring system which must be fitted with temperature monitoring which incorporates a high temperature alarm for the battery room and container and must 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 users 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 unadapted charging systems.
- Do not reverse the polarity,
- Do not mix different types of batteries or mix new and old ones together (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.
- Immediately disconnect 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, well-ventilated place, check the recommended storage temperature usually reported in the users manual prepared by the manufacturer, (e.g. 35°C),
- Keep away from heat sources (max 60°C) and sources of ignition. Prortect 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 in order to restrict the potential ejection of cells constituents and battery parts during fire.
- In case of mixed storage of goods and articles, organize seprate storage area for lithium-ion batteries and maintain a distance of 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 quantites, 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 neighbours 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,…).
- 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 during 15 minutes.
- Protect or cool with water the surrouding to avoid propagation of the fire.

Treatment of Waste Water.

- 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

10.7 METHODOLOGY USED IN RANKING 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.

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

Description of the parameters used in the matrixes

Severity:

Low	Low cost/high potential to mitigate. Impacts easily reversible, non-harmful insignificant change/deterioration or disturbance to natural environments.
Low-medium	Low cost to mitigate small/potentially harmful Moderate change/deterioration or disturbance to natural environment.
Medium	Substantial cost to mitigate. Potential to mitigate and potential to reverse impact. Harmful Significant change/ deterioration or disturbance to natural environment
Medium-high	High cost to mitigate. Possible to mitigate Great/Very Harmful Very significant change/deterioration or disturbance to natural environment
High	Prohibitive cost to mitigate. Little or no mechanism to mitigate. Irreversible. Extremely Harmful Disastrous change/deterioration or disturbance to natural environment

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 footprint area (1)
Low-medium	Whole of site (2)
Medium	Adjacent properties (3)
Medium-high	Communities around site area (4)
High	Local Municipal area (5)

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)

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/rights (5)

10.8 CUMULATIVE IMPACTS

Cumulative impacts were assessed in relation to other renewable energy developments in the proximity from the proposed Corona Solar PV Park. Mitigation measures are proposed, in order to mitigate the impacts that may result from the establishment of the Corona Solar PV 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 Corona Solar PV 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 and soils
- 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 and soils
- 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.

10.9 POSITIVE AND NEGATIVE *CUMULATIVE* IMPACTS THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND COMMUNITY

CUMULATIVE IMPACTS	
IMPACT	RATING
Increase in release of dust and increase in noise levels	Low negative
Increased potential for erosion and soil pollution	Low negative
Sterilise agricultural land (Only 0.25 ha per MW)	Medium negative
Increased potential for water pollution and water run-off	Low negative
Increased pressure on local water resources	Low-medium
Increase in potential to unearth archaeological evidence and graves as well as paleontological resources	Low negative
Increase in natural vegetation to be removed. Habitat loss for all animals. Increased potential for collisions of birds with power lines/infrastructure	Medium negative
Increased visual intrusion and nuisance (Impact **less** because of clustering of the solar parks)	Medium negative
Potential for an increase in criminal activity	Low-medium
High volume of vehicle trips with specific reference to heavy vehicles could contribute to a higher rate of deterioration of road surfaces	Medium negative
Accidents, and injuries or fatalities to road users	Low-medium negative
Increased potential for local Community development	High Positive
Boost local business for solar compo-nents	High Positive
Reduce CO^2 Emissions opposed to coal power stations Reduce emissions by > 900000 tons per annum. Even more of there are more solar farms. It save almost 250 000 tons of coal per solar park of this size.	High Positive

10.10 POSSIBLE MITIGATION MEASURES AND RESIDUAL RISK

- Speed of construction vehicles should be kept as low as possible(20-30km/h) to reduce generation of dust and noise.
- 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.
- The storm water must be managed so that erosion is not caused on the site.
- Construction vehicles must be well maintained and serviced to minimise leaks and spills.
- Construction activities should be restricted to the proposed development footprint.
- Chemical/temporary sanitation facilities at construction site must be regularly serviced to ensure no spills or leaks to surface and/or groundwater.
- Water used for domestic purposes (sanitation) must be treated before release to comply with standards for effluent release.
- 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.
- Water use in construction must be managed in such a way that there is no wastage of water as a resource
- 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.
- Panels must be washed with methods that can save on water use
- 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. The archaeologist or SAHRA must be notified whenever anything of importance is discovered.
- Clearance of vegetation should be restricted to footprint area and access roads.
- Care must be taken that unnecessary clearance of vegetation does not take place. Where possible, natural vegetation must be retained to limit this impact.
- Overhead transmission cables should be marked with bird diverters/spirals to make the lines as visible as possible to collision-susceptible species.
- Revegetate bare areas with vegetation that occur naturally in the area to limit the visual impact.
- Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond immediate surrounds of project site and aimed away from public roads and areas around the site. Minimise lighting to security lighting.
- To mitigate the visual impact, screening of the facility can be done with vegetation. The residual risk/impact is lowered.
- 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.
- Monitor vehicle volumes along Virginia Road.
- During construction phase, ensure that contractors load and off-load pedestrians on site and not at the access intersection.
- During the construction and operational phases, jobs must be created for unemployed local people and skills must be transferred to them.
- Where viable, the work must be executed in a labour-intensive manner to create as many jobs as possible.
- Use components of local companies as far as is possible.

The residual risk after the application of mitigation measures is LOW.

10.11 MOTIVATION FOR NOT INVESTIGATING ALTERNATIVES

N/A

10.12 CONCLUDING STATEMENT INDICATING THE PREFERRED ALTERNATIVE AND LOCATION OF ACTIVITY

The preferred alternative was selected based on the fact that it will have the smallest impact on the environment being located on the least sensitive area, avoiding potentially sensitive heritage sites and will be in line with Eskom requirements.

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 development with the positive effect of the socio-economic impact and the positive impact of renewable energy generation will also have a positive effect on the environment that would **offset** the negative effects of the development. The development can proceed with taking into account the applicable mitigation measures which will reduce impacts, including **cumulative impacts** to an acceptable level of risk.

11 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 ACTIVITY

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.

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

The potential aspects to assess during the EIA process include:

- Soils & agricultural potential;
- Avifauna aspects;
- Vegetation aspects;
- Heritage resources aspects;
- Noise aspects;
- Socio-economic 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;
- 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	• Construction machines and vehicles during clearing and construction of the PV Solar facility	• Health problems • Air pollution • Public nuisance
Emissions	• During operation of construction equipment. • Spraying of insecticides and herbicides during operation • During veld fires	
Noise	• Construction noise	
Water quality		
Pollution of water sources Pollution by *E.coli*	• 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	• 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	• Use of water during construction of the PV solar facility • Water use during operation	• Loss of a scarce resource • Increased pressure on water supply sources
Land/Soil degradation		
Soil contamination and degradation	• 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	• Pollution of soil • Soil degradation • Loss of topsoil • Effect soil characteristics, ecology & groundwater • Loss of topsoil
Biodiversity		
Decline in fauna and flora diversity	• Clearing of site for construction • Loss of habitat due to construction of panels • Power lines to Eskom power lines	• Loss of biodiversity • Loss of habitat • Negative impact on biodiversity • Negative impact on rare/endangered species and habitats • Animal deaths.
Cultural/Heritage		
Possible loss of heritage sites Damage to palaeontological resources	• Damage during construction or operation	• Possible loss of cultural heritage sites paleo-resources
Visual impact		
Change in the visual characteristics of the site	• Clearing of vegetation for panels • Presence of Solar facility	• Visual intrusion
Socio-economic impacts		
Job creation	• Increase in temporary and permanent work opportunities during construction and operational phases. • Loss of land available for farming without fair compensation.	• Socio- economic benefit

11.2 ASSESSMENT OF SIGNIFICANCE OF EACH ISSUE AND RISK/IMPACT AND AN INDICATION OF EXTENT TO WHICH ISSUES AND RISKS COULD BE AVOIDED OR ADDRESSED BY ADOPTION OF MITIGATION MEASURES

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 particular in the attached Environmental Management Programme (EMPr) can be the responsibility of Eskom or of the developer.

11.2.1 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Earthworks and Vegetation clearance	Air pollution Dust	Low-medium	Medium-high	Medium	Medium-high	Medium-high	Low	**Low-medium**	Medium
	Vehicle movement	Air pollution: Smoke	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	**Low**	Low-Medium
	Vehicle movement	Air pollution: Dust	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	**Low**	Low-Medium
	Vehicle movement	Noise pollution	Low-medium	Medium-high	Low-medium	Medium-high	Medium	Low-Medium	**Low**	Low-Medium
	Burning of cleared vegetation, solid waste & veld fires	Air pollution - excessive smoke	Low-medium	Medium-high	Medium	Low-Medium	Low	Low	**Low**	Low
	Cooking fires of workers	Air pollution: Smoke	Low	Medium-high	Low-medium	Low-Medium	Medium	Low	**Low**	Low-Medium

Project Phase	Impact Atmospheric Pollution and noise									
	Activity/Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Operation	Vehicle movement	Noise pollution	Low	High	Low-medium	Low-Medium	Low-Medium	Low-Medium	Low	Low-Medium
	Veldt fires	Air pollution caused by smoke	Low-medium	High	Low-medium	Low-medium	Low-medium	Low	Low	Low-Medium
	Burning of vegetation refuse and solid waste	Air pollution by excessive smoke	Low-medium	High	Low-medium	Low-Medium	Low-medium	Low	Low	Low-Medium
Cumulative impacts	Dust formation & Noise during construction phase	Increase in release of dust and increase in noise levels	Low	High	Low-medium	Medium	Medium	Low-Medium	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
- 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.
- Cleared vegetation must be stock-piled and should be removed regularly and be distributed amongst local communities. Cleared vegetation will not be burned on site.
- Cooking at construction site will 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 sealed to eliminate dust formation caused by strong winds and vehicle movement.
- Solid waste will 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
- Vegetation refuse should be composted if possible and re-used.

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

11.2.2 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 is 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Spilling of oil/diesel by construction machines or tanks	Contaminate soil	Low-medium	Medium-high	Low	Medium	Medium-high	Low	**Low**	Low-Medium
	Spilling of chemicals/sewage	Contaminate soil	Low-medium	Medium-high	Low	Medium	Medium-high	Low-Medium	**Low**	Low-Medium
	Topsoil & subsoil stripping, exposure of soils to wind and rain during construction causing erosion and sedimentation	Soil erosion	Medium	Medium	Medium	Medium	High	Medium-High	**Low - Medium**	Medium-
	Solid waste disposal	Soil pollution & nuisance	Low	Medium-high	Low-medium	Medium-high	Medium-high	Low	**Low**	Low-Medium
	Storm water over roads and cleared areas	Erosion	Low-medium	Medium-high	Low-medium	Low-Medium	Medium-high	Low-Medium	**Low**	Low-Medium
	Trenches for electric cables and water and sewerage pipes	Erosion	Low-Medium	Medium-high	Low	Low-Medium	Medium	Low	**Low**	Low-Medium
	Moving of equipment over soils	Compaction of soils	Low-Medium	Medium-high	Low-Medium	High	Medium-high	Low	**Low-Medium**	Medium

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

Mitigation measures - Construction Phase

- Clearance of vegetation should be restricted to the footprint area and access road.
- Construction activities should be restricted to the proposed development footprint.
- 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 be less than 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 closed containers and disposed of regularly at the closest municipal landfill site.
- Building rubble must be removed to municipal landfill 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 chances of erosion damage to the area.
- Soil should be handled when dry, to reduce compaction risk.
- During construction, sensitive soils with high risk of compaction must be avoided by construction vehicles and equipment, wherever possible, to reduce potential impacts
- Institute storm water measures including temporary and permanent erosion control plans.
- Minimise bare areas-revegetate as soon as possible to prevent soil erosion and mitigate cumulative effect of erosion.

Mitigation measures - Operational Phase

- Solid waste must be kept in closed waste bins and removed weekly to landfill 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 cumulative impact.

11.2.3 GROUNDWATER AND SURFACE WATER POLLUTION

Construction phase

- Lack of sanitation facilities may result in groundwater pollution and associated health risks.
- Construction vehicles 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 can cause erosion. Road construction will increase 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 when panels are in a relatively flat position.

Project Phase	Impact: Groundwater and Surface water Pollution									
	Activity/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Spillage of fuel and lubricants from construction vehicles	Ground-water Pollution	Low-Medium	Medium-high	Medium	Medium	Medium-high	Low	**Low**	Low-Medium
	Spillage of fuel and fuel tanks	Groundwa ter Pollution	Low-Medium	Medium-high	Medium	Medium	Medium-high	Medium-High	**Low**	Medium
	Clearing of vegetation	Erosion & siltation of streams	Medium	Medium-high	Medium	Low-Medium	Medium-high	Medium-High	**Low-medium**	Medium
	Solid waste disposal water resources	Pollution of freshwater resources	Low	Medium-high	Medium	Medium	Medium	Medium	**Low**	Low-Medium

	Sanitation seepage from chemical toilets or temporary sanitation system	Ground-water Pollution	Medium	Medium-high	Low-medium	Low-medium	Medium	Medium	**Low**	Low-Medium
Operation	Spillage of fuel and lubricants from vehicles	Ground-water Pollution	Low-Medium	High	Low-medium	Medium-high	Medium-high	Medium	**Low-medium**	Medium
	Solid waste disposal-freshwater resources	Ground-water Pollution	Low	High	Low-medium	Low-Medium	Low-medium	Medium	**Low**	Low-Medium
	Leakage from the permanent Sanitation system	Ground-water Pollution	Medium-high	High	Low-Medium	Low	Low-Medium	Medium	**Low-medium**	Medium
	Use of fertilizers, insecticides and herbicides	Pollution of streams & rivers	Low-Medium	High	Medium	Low	Medium	Medium	**Low**	Low-Medium
	Storm water runoff	Erosion & siltation of streams	Low-medium	High	Medium	Low-medium	Medium-high	Medium	**Low**	Low-Medium
	Cooling water for fire/thermal runaway at BESS	Pollution of surface and Ground-water	High	Low	Low	Low	Medium-high	Medium-High	**Low**	Medium
Cumulative impacts	Water pollution and increased water run-off	Increased potential for water pollution and water run-off	Low-Medium	High	Medium	Low-Medium	Medium	Medium-High	**Low**	Low-Medium

Mitigation measures – Construction phases

Precautionary measures recommended to prevent surface or groundwater pollution:

- Clearance of vegetation should be restricted to footprint area and access road.
- Construction activities should be restricted to the proposed footprint area.
- Cleared areas must be rehabilitated by reintroducing a grass layer to limit soil erosion.
- Drip pans must be used during re-fuelling and servicing of vehicles. Used parts must be contained and disposed of at licensed site for dumping of such 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 be less than 30 000 litres at construction camps. Diesel tanks and other harmful chemicals and oils must be stored within a bunded area. Any water from out of this bunding must flow through an oil/water skimmer.
- Vehicle maintenance and construction area must have bund walls and must be lined with impermeable material to prevent ground and surface water pollution.
- 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 municipal landfill site.

Mitigation measures - operational phase

- Solid waste must be kept in adequate waste bins and removed on a weekly basis to municipal 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.

11.2.4 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 the onsite boreholes.

Operational phase

Water use will be limited except for short periods when the PV modules are cleaned. The water needed for the operational phase will be provided from onsite boreholes.

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

Mitigation measures – Construction Phase

- Water should 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.
- Workers must be educated on the value of water and how to use it sparingly.

11.2.5 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Earth moving and soil clearance	Destroy archaeological evidence and heritage.	Low-medium	Medium-high	Low	Low	Low-medium	Medium-high	Low	Low
	Earth moving and soil clearance	Impact of Palaeontological resources	Medium	Medium	Low	Low	Low	Medium-high	Low	Low
Operation	Operational activities of development	Destroy archaeological evidence and heritage and graves	Low-medium	High	Low	Low	Low-medium	Medium-high	Low	Low
Cumulative impacts	Activities on site during construction and operation	Increase in potential to unearth archaeological evidence and graves	Low-medium	High	Low	Low	Low-medium	Medium-high	Low	Low

Mitigation measures – Construction and operational phases

- The heritage sites identified and indicated on the site lay out plan (CRS-HP01, CRS-HP02) has low significance and the site must be monitored during all phases in order to avoid potential destruction of *undetected* heritage sites.
- 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.

11.2.6 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 E & F) 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/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Earthworks and vegetation clearance at construction site	Loss of indige-nous plant species & distur-bance to sensitive habitat	Medium	High	Low-Medium	Medium	High	Medium	Low-medium	Medium
	Vegetation clearance and movement of people on the site at different development areas	The spreading of exotic invasive plant species Loss of indigenous plant species	Medium	Medium	Medium	Medium	Medium-High	Medium-High	Low	Medium

Project Phase	Environmental Aspect: Ecology (Fauna and Flora)									
	Activity/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
	Heavy machinery and vehicle movement on site - Spillages of harmful substances	Harm to biodiversity	Medium	High	Medium	Medium	Medium-High	Medium	**Low**	Medium
	Vegetation clearance and construction activities	Impact on avifauna	Medium	High	Low-Medium	Low	Medium	High	**Low-Medium**	Medium
	Construction activities close to 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	Medium	Medium-High	Medium	Medium	**Low**	Low-Medium
	Control of animals on site Heavy machinery and vehicle movement on site	Disturbance to and loss of indige-nous fauna to the area	Medium	Medium	Medium	Medium	Medium-High	Medium	**Low**	Medium
	The occurrence of veldt fires	The loss of indigenous fauna and flora	Medium-High	Medium	Medium	Low-Medium	Medium-High	Medium-High	**Low**	Medium
Operation	Rehabilitation of cleared areas	Spreading of exotic invasive plant species Loss of habitat and indigenous flora	Medium	High	Medium	Low-Medium	Medium	Medium-High	**Low**	Low-Medium
	The occurrence of veldt fires	The loss of indigenous fauna and flora	Medium-High	Medium	Medium	Low-Medium	Medium-High	Medium-High	**Low**	Medium
	Disposal and storage of solid waste and littering	The death/loss of indigenous fauna e.g. raptors, mammals and reptiles	Medium-High	High	Medium-High	Medium-High	Medium	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	Medium-High	Medium	Medium-high	**Low**	Medium

Project Phase	Environmental Aspect: Ecology (Fauna and Flora)									
	Activity/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
	The feeding of fauna e.g. birds &small mammals	Disturbance to biodiversity and natural movement of animals through the site The death/loss of indigenous fauna	Low-Medium	High	Low-Medium	Medium-High	Low-Medium	Medium	Low	Low-Medium
	Catching of wild animals e.g. reptiles, bids and small mammals as pets	Disturbance to biodiverse-ty and decline in indigenous faunal numbers	Medium-High	High	Low-Medium	Low-Medium	Low	Medium	Low	Low-Medium
	Birds colliding with power line and panels	Electrocution of birds	Medium-High	High	Low-Medium	Low-Medium	Low	Low	Low	Low
	The erection of fences and the construction of roads with a kerb	Fragmentation of habitat and restriction of movement of small mammals, reptiles and amphibians	Low-Medium	High	Low-Medium	High	Medium	Low-Medium	Low	Medium
Cumulative Impacts	Increased potential negative impacts on ecology of the area	Increase in natural vegetation to be removed. Habitat loss for all animals. Increased potential for collisions of birds with power lines/ infrastructure	Medium-High	High	Medium	Medium	High	Low-Medium	Medium	Medium

Mitigation measures – Construction phase

- Clearance of vegetation should be restricted to footprint area and access roads.
- Construction activities should be restricted to the proposed development footprint. -Do not use more agricultural cropland areas than planned for.
- Mark Construction areas well so that workers can stay within the boundaries
- Personnel and contractors must undergo induction with regards to avifauna and ecological aspects of construction.
- Construction must preferably take place outside of the bird breeding season.
- 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 must be retained to limit this impact.
- Walk through the new construction areas. Bird nests found in this phase must be reported to the ECO.

- Herbaceous layer should be revived after clearance of vegetation and actively managed through slashing during lifetime of the project. Small animals like sheep will be able 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.
- Alien invasive management must be implemented.
- 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.
- Construct a single fence if possible.
- "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).
- Report all incidences of collisions of birds with panels.
- Speed limit of 30km/h on site to avoid collisions with night birds and twilight active birds.
- Panels should be tilted towards the vertical when not in use
- All probable and high-risk perching surfaces should be fitted with bird guards and perch guards as deterrents. It must be nest proofed.
- Where possible the installation of artificial bird space perches or platforms at a safe distance from energised components which must also be insulated to reduce electrocution risk to birds
- 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/spirals to make the lines as visible as possible to collision-susceptible species.
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used
- No Fires should be allowed 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 will not be burned on site. The cleared vegetation should be stockpiled and distributed to the local communities.
- 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 access road and throughout the premises to limit impact of littering.
- The 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 may 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 should 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 the construction process.
- Cumulative impacts on the ecology of the area are habitat loss for fauna as well as increased potential for collisions and electrocutions of birds with power lines and power infrastructure. However, with the mitigation measures in place, the potential is low for significant negative impacts on the ecology of the area.

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.
- Alien invasive management must be implemented.
- 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 30 km/h on site to avoid collisions with night birds and twilight active birds.
- Panels should be tilted towards the vertical when not in use.
- 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 Affairs.
- 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 Veldt and Forest Fire Act, 1998.
- Lighting at night should be kept to a minimum. Use downward directed lights.

- The impact on the flying invertebrates will be minimized through the use of sodium vapour (yellow) lights as outside lighting.
- 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.

11.2.7 VISUAL IMPACTS

Construction phase

The natural aesthetic character of the site will be changed. However, the local communities will be informed of 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Buildings & panels	Visual	Low	High	Low-Medium	High	High	Medium	**Medium**	Medium
	Lights	Visual	Low	Medium	Low-medium	Medium-high	High	Low	**Low-Medium**	Low-Medium
Operation	Buildings and panels	Visual	Medium	High	Medium	High	High	Low	**Medium**	Medium
	Lights	Nuisance	Low	High	Low-medium	Medium-High	High	Low	**Low-Medium**	Medium
	Electrical lines	Visual	Low	High	Low	High	High	Medium-High	**Medium**	Medium
Cumulative Impacts	Increased visibility of another solar park and power lines in the area	Increased visual intrusion and nuisance	Medium-High	Medium	Medium	Low-Medium	High	Medium-High	**Medium**	Medium

Mitigation measures

- Only the footprint and a small "construction buffer zone" around proposed components are exposed and natural occurring vegetation, should be retained.
- Plan construction activities when vegetation is dormant to minimise impacts on wetlands and sensitive plants
- Revegetate/rehabilitate bare areas with vegetation that occur naturally in the area to limit the visual impact.
- Ensuring that cut to fill areas (if any) are revegetated with indigenous species that

relate to the original vegetation types, as soon as possible after the establishment of terraces/roads/parking areas.

- Ensure that dust suppressing techniques are in place at all times. These could include the regular wetting of the soil or the application of dust suppressing agents.
- Keep travelling speeds along unpaved roads within the site work area as low as possible so as 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 substation.
- Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond immediate surrounds of project site and aimed away from public roads and areas around the site. Minimise lighting to security lighting.
- Avoid high pole top security lighting along the periphery of the site and use only lights that are activated on illegal entry to the site.
- Ensure the perimeter fence is 'see through' and that its colour blends with the environment.
- Minimise number of light fixtures to the bare minimum and connecting these lights to motion sensors in order to limit light pollution.
- 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.
- Construction camp areas should either be screened or positioned in areas where they would be less visible from human settlements and main roads.
- Cumulative impacts will be low-medium-no other solar facilities in the 30 km radius have been constructed so far.

11.2.8 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Construction activities – excavation of foundations, trenches etc.	Loss or injury to human life	Medium	Medium-high	Low	High	Medium	Low-medium	Low	Medium
	Health issues	Risk of increase in possible infectious diseases	Medium-high	Medium-high	Low	High	Medium	Low-Medium	Low	Medium
	Security	Crime	Medium	Medium-high	Low-medium	Medium	Medium-high	Medium	Low - medium	Medium
	Fire hazards	Loss of human life and construction equipment etc.	High	Medium-high	Medium	Low	Low-Medium	Medium-High	Low-Medium	Medium
Operation	Security	Crime	Medium	High	Medium	Medium	Medium-high	Medium-High	Low-Medium	Medium
	Fire hazards at Panels and BESS	Loss of human life, biodiversity, buildings, infrastructure etc.	High	High	Medium -High	Low	Low	Medium--High	Low	Medium
Cumulative Impacts	Higher number of people in the area increases safety risks	Potential for an increase in criminal activity	High	Medium	Medium -High	Medium	Medium-high	Medium	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 on-site security to ensure the panels and equipment are well protected.
- Contractors must ensure that to protect employees and other people in the area, 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 will be burnt on the premises or surrounding areas.
- Firebreaks should comply with the National Veldt and Forest Fire Act, 1998.
- Fire extinguishers and fire-fighting equipment must be available especially to be able to combat fires at the BESS.
- 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.

- 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.
- 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.
- A security fence should be constructed along the boundary of the development.
- Advisory and warning signage must be visibly displayed.
- Cumulative impacts of impact can be successfully mitigated if managed properly.

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.

11.2.9 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 24 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	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction & Operation	Construction activities – Increase in traffic	High volume of vehicle trips specifically heavy vehicles could contribute to a higher rate of deterioration of road surfaces	Low	High	Low-Medium	Low	Low	Low	**Low**	Low
	Road Safety Issues	Spacing of intersections impacts significantly on the operation, level of service and capacity of a roadway.	Low	High	Low-medium	Low	Low	Low	**Low**	Low
	Road Safety Issues Sight distance	The vertical and horizontal road alignment could influence road safety in terms of intersection and stopping sight distances.	Low	High	Low-Medium	Low	Low	Medium to High	**Low**	Low
	Road Safety Issues Speed Limits	High vehicle speeds at access intersections could result in vehicle accidents which could be caused by several factors.	Low	High	Low-Medium	Low	Low	Low	**Low**	Low
	Road Safety Issues Intersections	Without dedicated turning lanes, especially dedicated Left hand turn lanes, could result in vehicle accidents for instance vehicles waiting to turn left and a vehicle that is travelling straight crashing into the back of the vehicle waiting to turn.	Medium	High	Low-Medium	High	High	Medium-high	**Low**	Medium-High
	Road Safety Issues Pedestrians	The conflict between vehicles and pedestrians could lead to fatalities.	Low	High	Low-Medium	Low	Low	Low	**Low**	Low

Project phase	Impact: Traffic and Road Safety									
	Activity/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
	Road Safety Issues Public transport	Loading and off-loading of visitors and workers by public transport could lead to unsafe manoeuvres by vehicles at intersections which could lead to fatal vehicle accidents.	Medium	High	Low-Medium	High	High	Medium-High	**Low**	Medium-High
Cumulative Impacts	Construction activities – Increase in traffic	High volume of vehicle trips with specific reference to heavy vehicles could contribute to a higher rate of deterioration of road surfaces	Low	High	Low-Medium	Low	Low	Low	**Low**	Low
	Road safety issues	Accidents, and injuries or fatalities to road users	Medium	High	Low-Medium	High	High	Low	**Low**	Medium-High

Mitigation measures

- Intersection sight distances for access intersection need to be complied with. This should be determined as part of the detail design phase.
- Monitor vehicle volumes along Road R73. Once volumes become high with high vehicle speeds, gaps in traffic flow could become problematic for vehicles to enter traffic flow from proposed Corona Solar Park development.
- Construct access intersection with dedicated left-turn lane on northern approach of Point D on Road R73.
- During construction phase, ensure that contractors load and off-load pedestrians on site and not at the access intersection.
- Provide a dedicated loading and off-loading area on site and ensure that contractors make use of it and not stop within Road R73 road reserve at the proposed access intersection to load and off-load workers.

11.2.10 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

A positive number of permanent jobs will be created for local people during this phase.

Project phase	Impact: Job creation									
	Activity/ Aspect	Specific impact	Severity	Duration	Extent	Frequency	Probability	Compliance	Significance	
									With Mitigation	Without Mitigation
Construction	Job creation	Job Creation (150 jobs)	High +	High +	Medium-high +	High +	High +	Low	N/A	High Positive+
	Solar energy value chain	Boost local business for solar components	High Positive+	Medium-High Positive	High Positive+	High Positive+	High Positive+	Low	N/A	High Positive+
	Crime	Possible rise in crime levels in area	Low-Medium	Medium High	Low	Medium	Medium-High	Medium-High	Low	Low-medium
Operation	Local Community /businesses development	Local Community development	High Positive+	High Positive+	High Positive+	High Positive+	High Positive+	Low	N/A	High Positive+
	Contribute power to the National Grid	Reduce load shedding periods	High Positive+	High Positive+	High Positive+		High Positive+	Low	N/A	High Positive+
	Investment of R2bn.	Foreign investment in country and province	High Positive+	High Positive+	Medium		High Positive+	Low	N/A	High Positive+
	CO2 Emissions	Reduce CO^2 Emissions opposed to coal power stations	Medium High Positive	High Positive+	High	High Positive+	High Positive+	Low	N/A	High Positive+
	Permanent Job Creation	40 new permanent jobs created	Medium High Positive	High Positive+	Low	High Positive+	High Positive+		N/A	High Positive+
	Vandalism	Possible theft of solar panels	Low	High Positive+	Low	Low	Low	Low	Low	Low
Cumulative impacts	Increased potential for job creation.	Increased potential for local Community development	High Positive+	High Positive+	High Positive+	High Positive+	High Positive+	Low	N/A	High Positive+

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 is in need of more job opportunities.

12 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, the following impacts were regarded as potentially significant impacts:

i. Job creation (Positive impact)
ii. Traffic & Road safety

These impacts will now briefly be discussed.

12.1.1 CUMULATIVE IMPACTS

i. Job creation will be cumulative once the project is implemented.
ii. This is cumulative as the impact is added to the current road safety.

12.1.2 NATURE OF IMPACT

i. Local communities will **benefit** in various ways, including job opportunities, skills development and other projects.
ii. The impact could result in loss of life or injuries.

12.1.3 EXTENT AND DURATION OF IMPACT

i. Extent is local and regional and the duration is for the life of the development.
ii. The impact is local and for the duration of the development

12.1.4 PROBABILITY OF OCCURRENCE

i. The probability of occurrence is high.
ii. The probability is high.

12.1.5 DEGREE TO WHICH IMPACT CAN BE REVERSED

i. Impact should not be reversed although reversible.
ii. The impact is reversible should the development be decommissioned.

12.1.6 DEGREE TO WHICH IMPACT CAN CAUSE IRREPLACEABLE LOSS OF RESOURCE

i. This impact will not lead to an irreplaceable loss of any resources.
ii. The impact could lead to loss of life.

12.1.7 DEGREE TO WHICH IMPACT CAN BE MITIGATED

i. This impact will not lead to an irreplaceable loss of any resources.
ii. The impact can be mitigated successfully.

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

The main issues identified as a result of the specialist studies include the following:

- Visual impacts
- Soil erosion (Wind and water)
- Impact on biodiversity (bird collisions)
- Agricultural land availability
- Archaeological sites
- Paleontological finds
- Impacts on traffic safety.

These issues are highlighted in the specialist reports appended in the annexures to this report and the significance of these impacts have been calculated and recorded in the Impact tables in section 12. The mitigation measures and actions to achieve the outcomes are detailed in the attached EMPr.

The following table summarizes the aspects and issues from the specialist reports

SPECIALIST	FINDINGS	RECOMMENDATIONS
Landscape Architect: Visual Impacts	There were no visual receptors with extreme relevance ratings for Corona Solar PV Park. All the relevance for receptors are marginal. Impacts to views are the highest when viewers are identified as being sensitive to change in the landscape, and their views are focused on and dominated by the change. According to the visual specialist the vanishing threshold for the magnitude has been established at 8km away. This is the distance where no discernible impact is observed, even if the proposal is technically still visible.	1. Good housekeeping to reduce dust to an absolute minimum in all working areas and the access roads. 2. Structures should be painted in a manner that mimics the hues of existing vegetation, specifically the warehouses, workshops and control buildings associated with the substation. 3. Screening of infrastructure during construction. 4. Dust suppression must be done during construction. 5. Existing vegetation should be retained where possible. 6. Rehabilitation plan to be implemented after vegetation clearance. 7. Construction activities to be limited to daylight hours. 8. Lighting should be kept to a minimum. 9. Lighting should be carefully directed and only used where necessary. 10. A video-surveillance system using infrared or microwave video cameras, which do not need a switched-on lighting system, is recommended. 11. The infrastructure should be earthy tones and greys with toned-down hues, instead of white or cream colored or black.
Soil Specialist: Soil Potential assessment	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. The cultivated land was largely not considered for the development outside the limits of the compliance guidelines, and therefore only 0.25ha of cultivated and will be developed per 1 MW of land used for the solar plants. Therefore, the site should be classified as marginally suitable for arable agriculture due to its physical characteristics. The grazing potential of these areas is marginal for extensive livestock production. The climatic conditions (annual rainfall 560mm) render the soils marginal for arable agriculture.	1. Unnecessary soil compaction must be avoided. 2. Minimize the area of land disturbance. 3. Stockpile topsoil separately from subsoil. 4. Avoid sensitive areas prone to compaction or erosion. 5. Erosion and dust control measures to be implemented. 6. Storm water management plan to be implemented. 7. Exposed, bare soil must be minimized. 8. Topsoil to be conserved and maintained where possible. 9. Store chemicals on impervious area 10. Soil pollution to be avoided and prevented. 11. Treat spillages according to correct procedures 12. Restrict development to specific areas.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	Soil **compaction** can be problematic. Soil **erosion** can be caused Soil **pollution** can be caused. Loss of **land capability**.	
Archaeologist: Archaeology and graves	Two Historical Period settlements or potential settlements (CRS-HP01, CRS-HP02) occurs within the proposed Corona Solar Park Project and the powerline corridor and impact on the sites is likely. However, little remains of the potential settlements in terms of heritage features and material culture and the sites are rated as low significance. It is the opinion of the Specialist that the proposed Corona Solar Park and its associated power line connection will have a little to negligible negative cumulative impact on the heritage value of the area.	1. Monitoring throughout all phases of the project will be required in order to avoid the potential destruction of undetected heritage sites. 2. It is recommended that the EIA public participation and social consultative process address the possibility of human burial sites occurring in the project area. 3. 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.
Paleontological specialist	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.	1. In the event that fossils are discovered in the course of the proposed development, the Environmental Control Officer must follow the steps outlined in the Chance Find Protocol (Appendix A) whereby a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented. The Chance Find Protocol must be incorporated into the Environmental Management Programme (EMP) for the proposed development.
Avifauna specialist: **Impact on biodiversity (bird collisions)**	PV solar plants may impact directly or indirectly on birds. Direct impacts typically include: • **Loss of habitat and degradation of bird habitats**, • Disturbance to birds during the construction and operational phases, • Bird collisions with the solar panels/ power lines.	1. Put bird diverters/spirals on power lines. 2. Put bird guards and perch guards as deterrents on infrastructure. 3. The installation of artificial bird space perches or platforms at a safe distance from energised components 4. Use bird-friendly powerline designs. 5. Keep activities inside development area.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	• Electrocution of birds perching on the associated power transmission structures, • Collisions of birds with transmission line infrastructure. • Poisoning by pollution • Cumulative impact of numbers of solar facilities and power lines in the area. 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.	6. Strict environmental control measures to be implemented. 7. Limit speeds on site. 8. Keep lighting to the minimum at night 9. Train ECO and workforce well 10. Restrict clearance to the footprint. 11. Rehabilitate disturbed areas 12. Erosion and AIP control
Ecological specialist	• 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 listed species Boophane disticha and Helichrysum nudifolium 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.	1. A permit should be obtained from the authorities before any of these protected plants are eradicated. These plants should form part of a rescue and relocation programme should the development activities impact on populations. 2. 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. 3. Minimize the amount of land disturbance 4. Protect all areas susceptible to erosion 5. Institute a monitoring programme to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Once detected, an eradication/control programme should be implemented to ensure that the species' do not spread to surrounding natural ecosystems.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	• A number of 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 peripheral grassland and woodland habitats surrounding the development site. • 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.	6. A detailed species rescue, relocation and re-introduction plan should be developed and implemented by a qualified person before any excavations or disturbance commence. 7. Mitigation measures and monitoring should be implemented should the development be approved. 8. Where trenches/holes pose a safety risk, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. 9. No animals will be poached during the construction of the solar park. 10. 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. 11. Maintain proper firebreaks around entire development footprint. 12. Do not feed any wild animals on site; 13. Waste bins and foodstuffs should be made scavenger proof; 14. Roads in the area should be designed without pavements to allow for the movement of small mammals; 15. Monitoring of the environmental aspects should be done over the longer term to ensure that impacts are limited to a minimum during the construction and operational phases. 16. 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.
Traffic Specialist	• Vehicle access to and from the Proposed Solar Park is planned to be gained from and to Road R73 • No additional road infrastructure is required from a traffic capacity point of view other than the construction of the proposed access intersection.	1. Provide 60 m dedicated left-turn lane on the northern approach of Road R73. 2. Provide reflective road studs as part of the proposed intersection to improve visibility of the intersection geometry when it is dark. 3. Provide relevant road traffic signs and road markings at site access. 4. A dedicated public transport loading and off-loading area should be provided on site where workers and visitors can be loaded and off-loaded within a safe and dedicated area.

SPECIALIST	FINDINGS	RECOMMENDATIONS
	• Reserve capacity is available at the relevant proposed intersection on the existing road network. • No road safety-related mitigating measures in terms of intersection spacing would be required. • Intersection sight distances is sufficient at the proposed access intersection and no mitigating measures would be required. • No road safety-related mitigating measures in terms of the speed limit would be required. • No road safety-related mitigating measures in terms of pedestrian movement would be required. • It was concluded that the road network-related impact during the construction and operational phases for activities as part of the Proposed Solar Parks (cumulatively) will be the same as for the construction and operational phases of Florida, Corona, and Quagga Solar Parks individually.	5. Approval for the positions and geometric layouts for the proposed access intersections and relocation of existing intersections 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. 6. The same recommendations would apply if all three solar parks namely Florida, Corona & Quagga would be constructed at the same time.

14 ENVIRONMENTAL IMPACT STATEMENT

14.1 SUMMARY KEY FINDINGS OF THE EIA

It can be concluded that there will be environmental impacts including cumulative impacts as a result of the proposed development of the Virginia 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 site will be demarcated as no-go areas, therefore limiting the possible negative environmental impacts to an acceptable level.

14.2 MAP (APPROPRIATE SCALE) WHICH SUPERIMPOSES PROPOSED ACTIVITY AND ITS ASSOCIATED STRUCTURES AND INFRASTRUCTURE ON ENVIRONMENTAL SENSITIVITIES OF PREFERRED DEVELOPMENT FOOTPRINT ON APPROVED SITE AS CONTEMPLATED IN ACCEPTED SCOPING REPORT INDICATING AREAS TO BE AVOIDED, INCLUDING BUFFERS

A map showing the proposed activity and associated structure on the environmental sensitivities is included in Annexure B.

14.3 SUMMARY OF THE POSITIVE AND NEGATIVE IMPACTS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

NEGATIVE IMPACTS	
Air quality-	Low impact
Noise impact-	Low impact
Soils Impact-	Low to Low-medium Impact
Groundwater and surface water impacts-	Low to Low-medium impacts
Water Use impact	Low-Medium impact
Archaeological impacts	Low impacts
Impact on Fauna and Flora	Low impact with medium cumulative impact
Visual impact	Medium visual impact
Health Security and Fire impacts	Low-Medium impacts
Traffic impact	Medium impact

POSITIVE IMPACT	
Socio-economic impact	High positive impact

15 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.

In order to minimize negative environmental impacts, avoidance seemed to be the best option in terms of the main issues, although with careful mitigation most of the negative impacts can be mitigated to acceptable levels including:

- Visual impacts
- Bird collisions - limit occurrences
- Impacts on soils
- Impacts on biodiversity
- Degradation of archaeological sites/paleontology.
- Impacts on Traffic

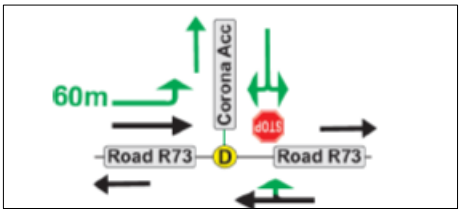
16 ASPECTS WHICH WERE CONDITIONAL TO THE FINDINGS OF THE ASSESSMENT BY THE EAP OR SPECIALISTS WHICH ARE TO BE INCLUDED AS CONDITIONS OF AUTHORISATION

- Archaeological discoveries:
    - If anything of archaeological/paleontological significance is found, the archaeologist as well as SAHRA must be notified immediately.
    - Strict monitoring should be done during the construction phase.
- Eskom-approved; bird friendly devices (diverters/spirals) must be attached to the powerlines to avoid bird collisions/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.
- Protected plants on site – permit applications and avoidance

  An ecologist should be appointed to assist with permit applications as well as assistance on site before construction commences during ground truthing.
- No development in the flood line zone without a water use license.
- Inform staff of the need to watch for potential fossil occurrences.
- Inform staff of the procedures to be followed in the event of fossil occurrences.
- Traffic Impact

    - Provide 60 metres dedicated left-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 at site access.



- No public transport is available in the area. Transport for workers should be by means of arranged or contracted transport. A dedicated public transport loading and off-loading area should be provided on site where workers and visitors can be loaded and off-loaded within a safe and dedicated area.
- Approval for the positions and geometric layouts for the proposed access intersections and relocation of existing intersections 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.
- The same recommendations would apply if all three solar parks namely Florida, Corona & Quagga would be constructed at the same time.

17 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 comply with the conditions of the environmental authorization at all time.

18 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 comments from the competent authority to enable AGES to compile the Final Impact Assessment Report.

Conditions to be included in the environmental authorization

- 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.
- Permits are needed if any protected plants will be affected by the development and consequently have to be removed from the construction area.
- Invader plants must be controlled though 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 of subsurface paleontological or archaeological material be exposed during development activities, all activities should be suspended, and the archaeological specialist should be notified immediately.

19 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 within 10 years from date of the Environmental Authorisation. The *specific date* cannot be finalised at this point in time as it is dependent on the date of the authorisation as well as on various other authorisations and administrative matters.

Post construction monitoring must be done for at least 2 Years after finalisation of construction.

20 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

I, Anton von Well, appointed EAP for the proposed Corona Solar PV Park 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…19/07/2023…….

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